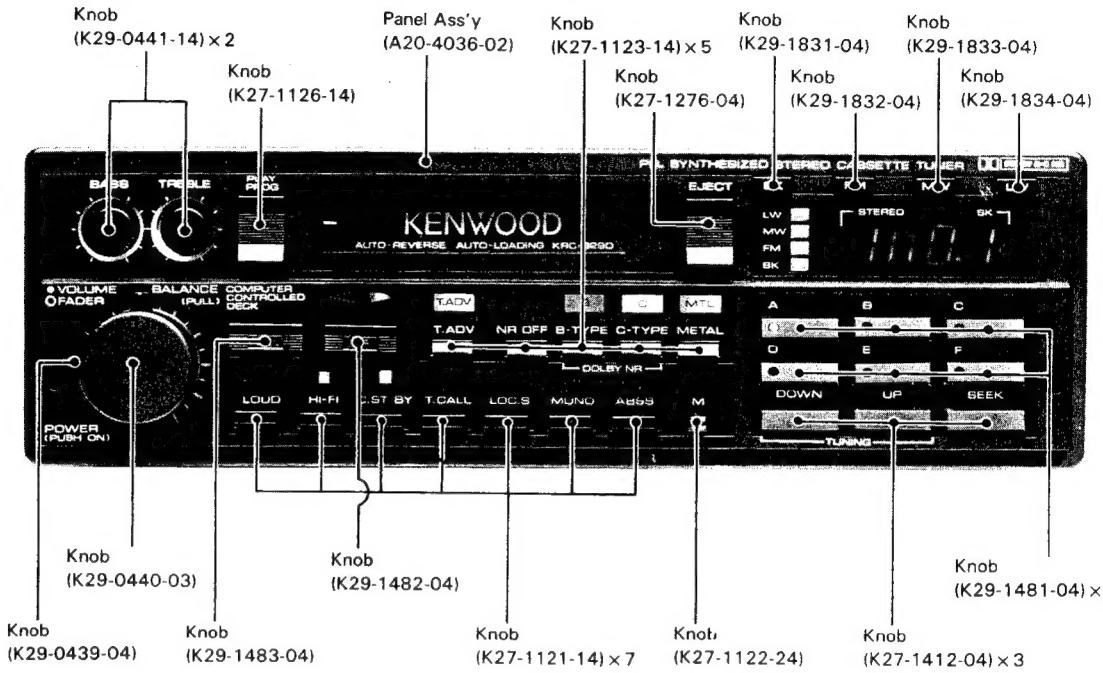
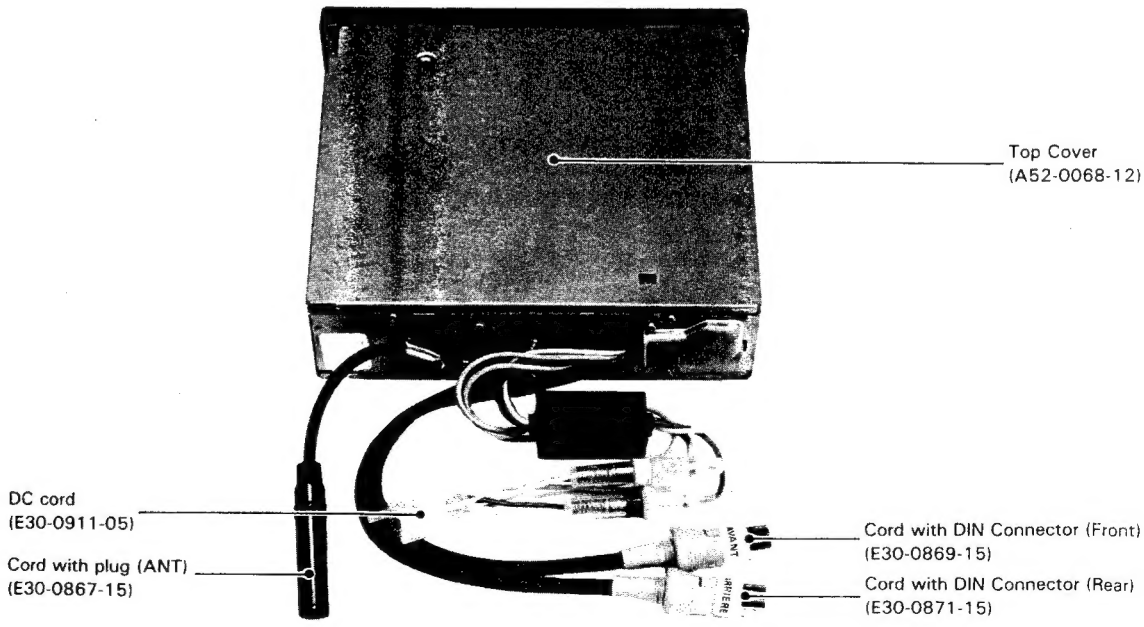
SERVICE MANUAL

KENWOOD KRC-929D

PLL SYNTHESIZED STEREO CASSETTE TUNER





* Refer to Parts List on page 38.

INTERNAL VIEW/DISASSEMBLY FOR REPAIR

INTERNAL VIEW

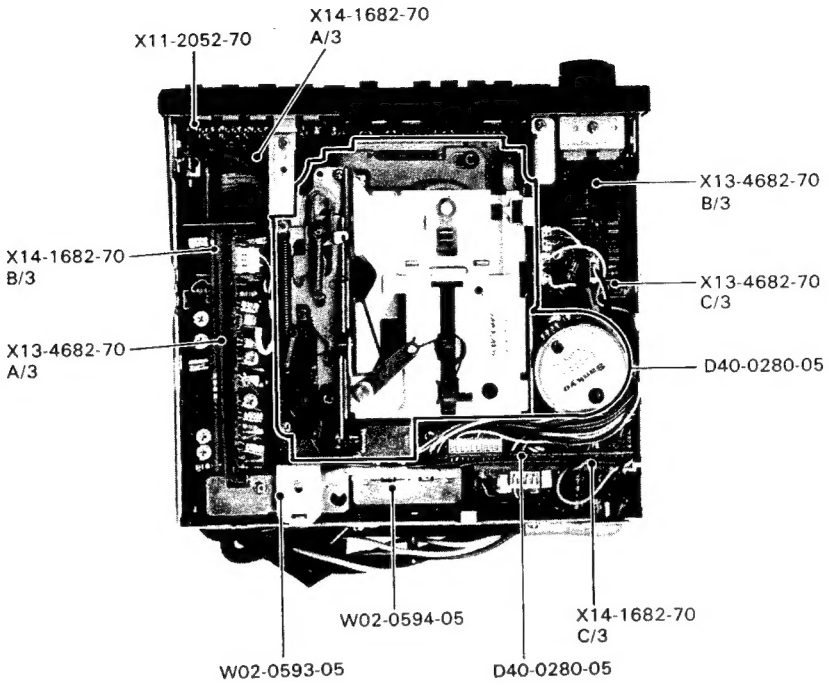


Fig. 1

DISASSEMBLY FOR REPAIR

1. To Remove the Control PC Board

1) Remove the screws fixing the snap-action switch.
2) Remove the solder from the screw fixing the pc board and remove it.

2. To Remove the Keep Solenoid

3) Remove the screws fixing the solenoid.

3. To Remove the Eject Lever Assembly

4) Remove the screws, and remove the assembly in the direction of the arrow.

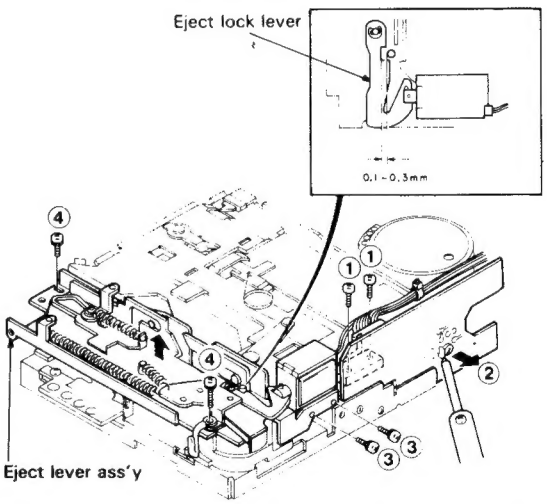


Fig. 2 Procedure for removing PCB and eject lever

DISASSEMBLY FOR REPAIR

4. To Remove the Head & Switch Ass'y

5) Remove the eject lever assembly, and take off the solder from the screw retaining the pcb and remove the screw.

6) Remove the screws fixing the head, and remove the head, the board and SW. To assemble, first temporarily fix the slide switch as in the figure. Confirm that "PROG" functions normally and tighten the screw and solder.

5. To Remove the Pinch Roller

7) Remove the E ring. When assembled, clean the pinch roller with pure alcohol.

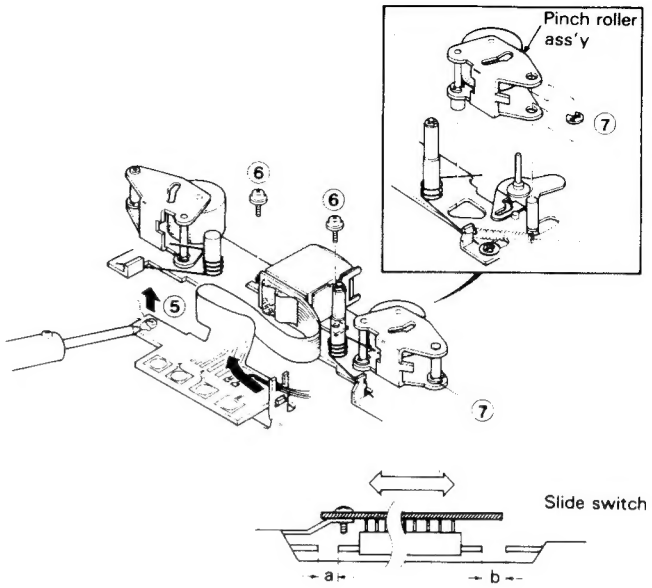


Fig. 3 Procedure for removing the head and pinch roller

6. To Mount the Eject Lever

8) Push the head base assembly in the direction shown in the figure, and assemble the eject lever assembly and the cassette holder at the same time.

9) At this time, assemble the eject gear in the position shown in the figure.

10) Fasten the screw.

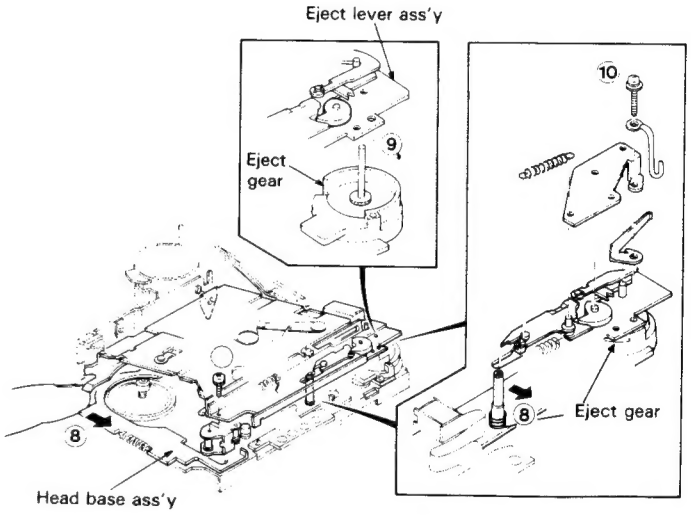


Fig. 4 Procedure for mounting the eject lever

7. To Remove the REW Solenoid

Remove the screw ①.

8. To Remove the Reverse Solenoid.

Remove the screws ②.

9. To Remove the R/F Solenoid

Remove the screw ③.

10. To Remove the Motor

Remove the screws ④.

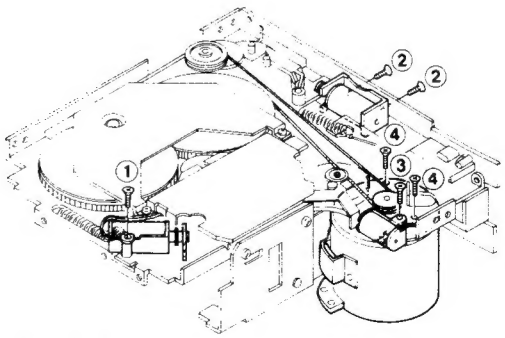


Fig. 5 Procedure for removing the solenoids

DISASSEMBLY FOR REPAIR

11. To Remove the Belt

Remove the screws ⑤.

When assembling, clean the belt with pure alcohol before mounting.

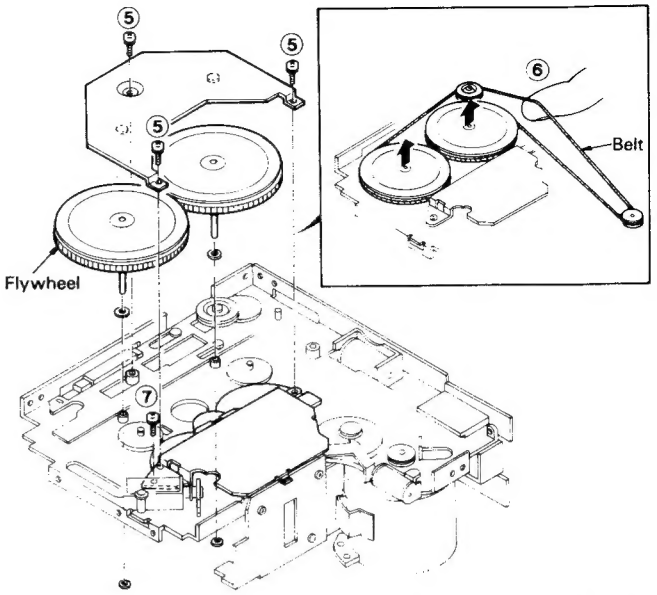


Fig. 6 Procedure for removing the flywheels and reels

12. To Remove the Reels

Remove the two flywheels, and remove the screw ⑦.

Remove the guide bracket by removing the screws ⑧. Compress the B.T. spring ⑪, and remove the reels in the direction shown by arrow ⑫. Take off the reels after removing the lock washers.

Remove the solder from the reed SW board and the metal fittings (⑬).

Remove the screw ⑭, and remove the reed SW board.

* Assembly should be carried in the reverse order to disassembly.

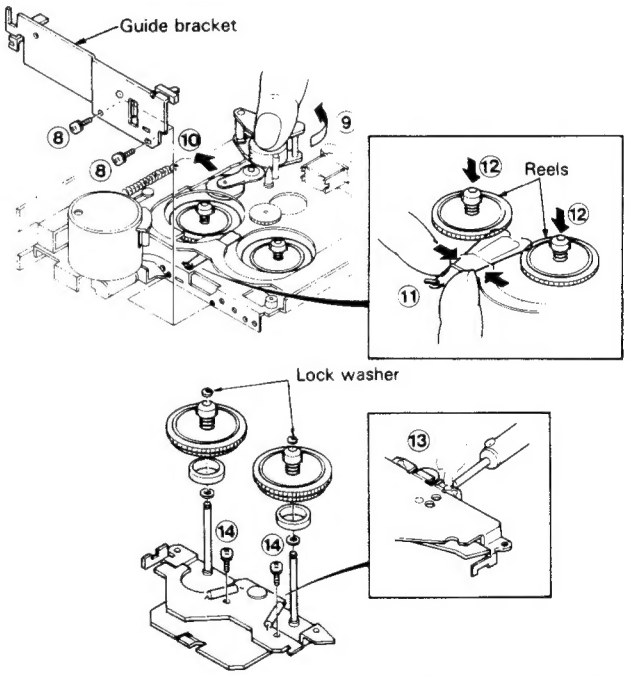


Fig. 7 Procedure for removing the metal fittings fixing the reels

MECHANISM DESCRIPTION

1. AUTO-LOADING Operation

When a cassette tape is inserted, the microswitch turns on, the power is turned on, the motor rotates and the idle pulley B rotates. Then, the eject idler gear C mounted on the head base rotates, and the gear A of the planetary gear portion rotates. Next the whole planetary gear mechanism rotates to turn the pinion gear D . Accordingly, the eject lever assembly E moves leftwards, and the lock pin F enters the groove of the eject lever G . The lock pin is held by the keep solenoid.

Note: **If the motor of the removed mechanism is to be powered, load a cassette tape or push in the cassette guide. If the motor is powered without doing this, the mechanism may malfunction.**

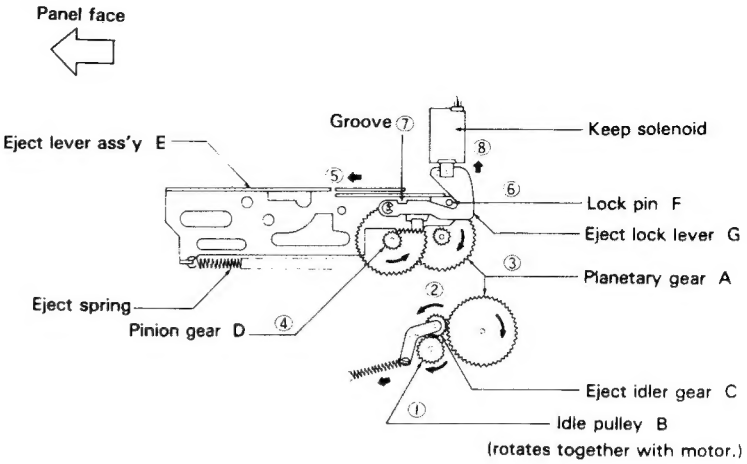


Fig. 8 AUTO-LOADING operation

2. CASSETTE STANDBY and EJECT Operations

(1) In CASSETTE STANDBY (PAUSE) operation, if the C.STBY button is depressed to release the hold of the keep solenoid, the eject lock lever is released and the cassette holder is lifted up to the position of the cassette insertion port by the strong tensile eject spring.
At this time, the cassette guide is locked so that the cassette tape is not ejected. In pause release, play mode is automatically obtained by a depression of the C.STBY button or by a C.STBY signal of the tuner.

(2) The EJECT operation releases the keep solenoid and simultaneously activates the music sensor (MS) solenoid to operate, releasing the lock of the cassette guide to eject the cassette tape.
Therefore, if the Memory Backup lead (Yellow) is not connected to the power when ignition key is turned off (key-off), the MS solenoid does not operate, and the cassette tape is not ejected.

3. FF/REW Operation

This mechanism performs FF/REW operation with respect to tape running direction. That is depression of the FF button activates operations at the normal side and the reverse side in opposite directions to each other. This is decided by the control circuit.

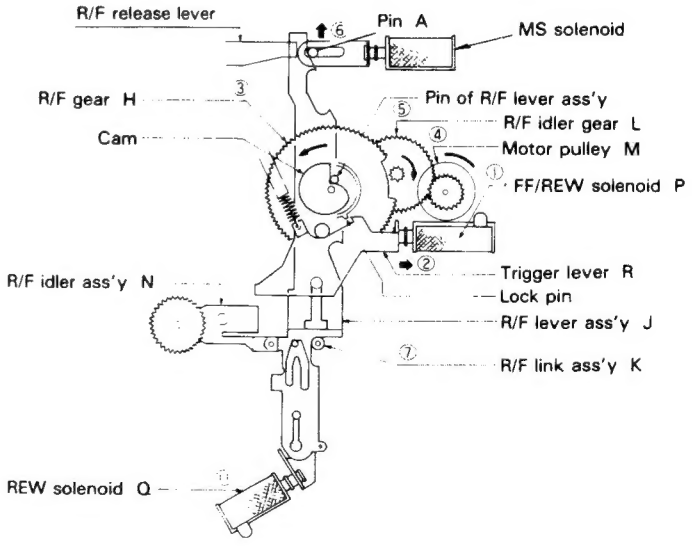


Fig. 9 FF/REW operation

MECHANISM DESCRIPTION

The following is the operational description for the normal direction.

(1) FF

When the FF/REW solenoid P operates, the trigger lever R is pulled to release the lock of the R/F gear H and the R/F gear rotates. Then, the R/F gear engages with the R/F idler gear L through the constantly rotating motor pulley M and rotates by 360 degrees. At the same time, the R/F lever assembly J is pushed up by the cam on the R/F gear in the direction shown by the arrow in Fig. 9. When the R/F lever assembly moves, the pin 1 of the R/F link assembly K is kept directed by a spring to the groove at the left side of the R/F lever assembly. Further, the pin 2 of the R/F link is pushed up in the direction shown by the arrow in Fig. 10, and the R/F idler assembly N interlocking with the pin 3 moves to the flywheel and the reel of the take-up side and transmits rotation to perform fast forward operation.

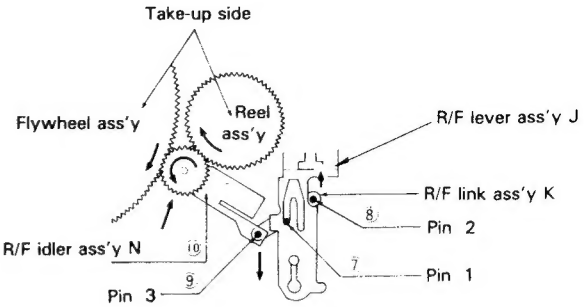


Fig. 10 FF operation

(2) REW

At REW operation, the REW solenoid Q operates in addition to the operation of the FF/REW solenoid, and the pin 1 of the R/F link assembly is directed to the groove at the right side of the R/F lever assembly. Then, the pin 3 of the R/F link assembly is pushed up in the direction shown by the arrow in Fig. 11. The R/F idler assembly interlocking this pin 3 moves to the flywheel and the reel of the supply side to rewind the tape.

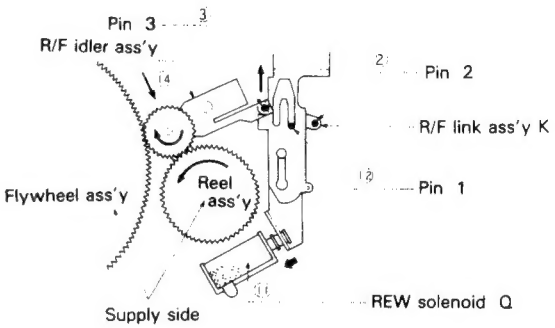


Fig. 11 REW operation

* Since the R/F assembly is pushed up and locked with the pin A, FF/REW is released by operation of the MS solenoid to move the pin A. Further, if the reverse solenoid operates, the R/F release lever moves the pin A to release FF/REW.

4. AUTO-REVERSE Operation

The reed switch detects, and the reverse solenoid is driven by the control circuit. When the reverse solenoid operates, the lock of the R/F release lever S is released. The R/F release lever pushes the change gear T to rotate it. Then, the change gear engages with the continuously rotating reverse idler gear U and rotates by 180 degrees. At this time, the roller mounted on the rear face of the change gear moves the select lever to switch the contact pressure of the pinch roller, reversing the tape running direction. Further, the slide switch on the head and sw pcb is moved to switch the track.

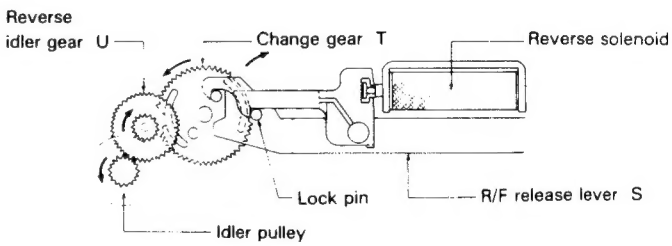
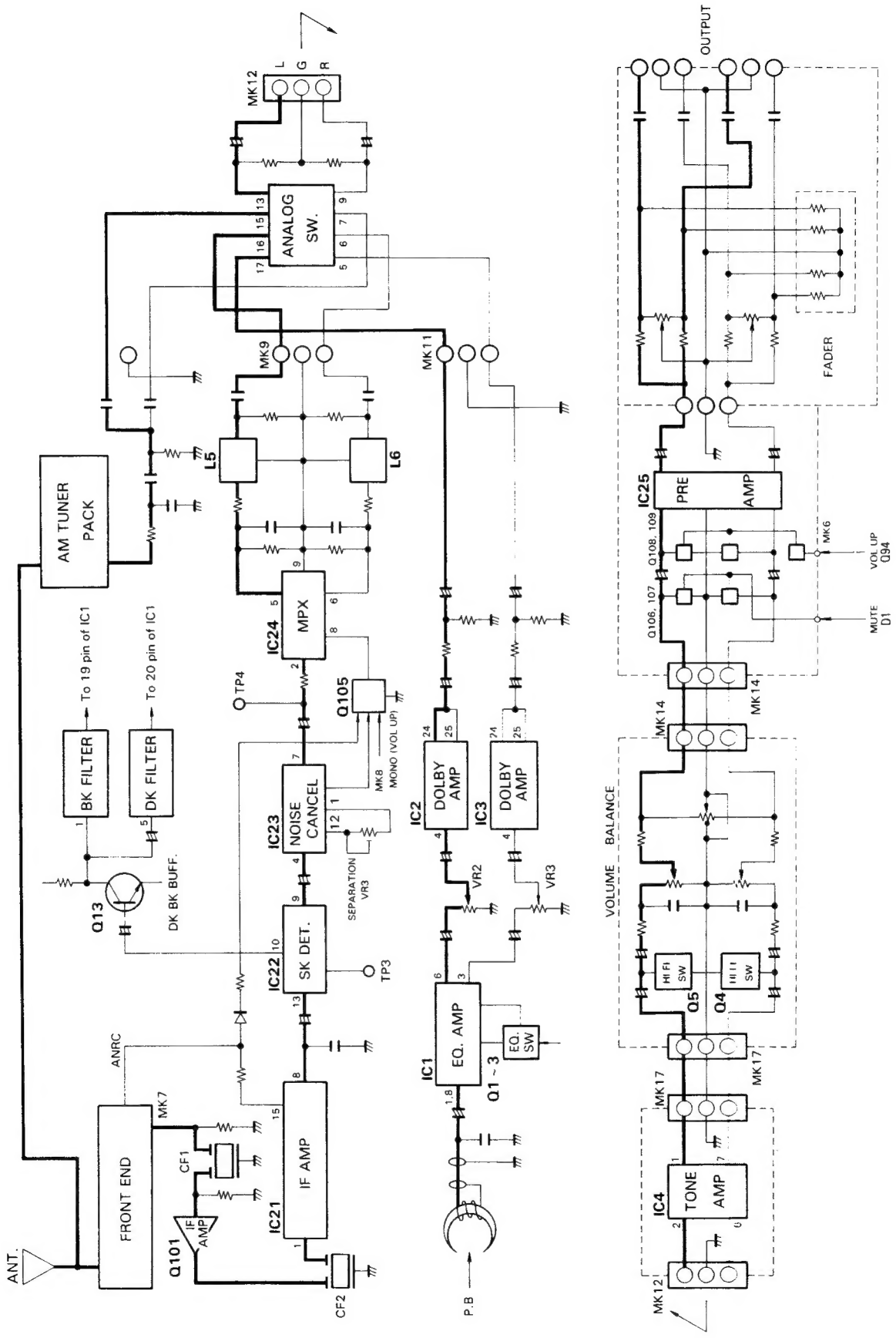


Fig. 12 AUTO-REVERSE operation

5. TAPE ADVANCE

The head also picks up the signal at the time of FF/REW operation. The tape advance circuit senses gaps between five selections and activates the MS solenoid for releasing FF/REW and returning to PLAY. For REPEAT operation, the in-between music gap or the end of a selection is sensed during PLAY and the tape advance operation to the REW direction to find the top of that music for replay performed by the control circuit.

BLOCK DIAGRAM

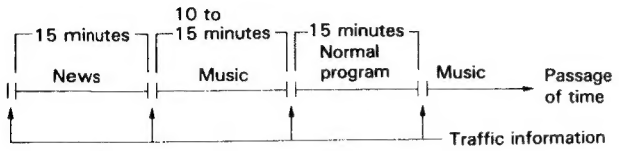


CIRCUIT DESCRIPTION

CIRCUIT DESCRIPTION

1 Functional classification of the ARI system

The ARI system permits the insertion of traffic information into an ordinary FM programming every 10 to 15 minutes. An example is illustrated in Fig. 13.



(Prior to the 15 to 30 second traffic information, an ID tone is given.)

Fig. 13

The ARI system can be roughly classified into the following three according to reception functions.

SK: Sender Kennung (The broadcasting station ID system)

DK: Druchsage Kennung (The traffic message ID system)

BK: Bereich Kennung (The broadcasting station's service area ID system)

In the actual market, depending on the grade of products, various products are available, such as the one incorporating SK only, SK + DK = SDK, or SDK + BK = VL (KRC-929D) (Verkehrslasts für Langstreckenfahrer).

2 SK system

The ID system which determines whether a broadcasting station is one which provides traffic information or not. The broadcasting station ID signal (57 kHz) is called the SK signal. The SK signal is a 57 kHz subcarrier signal and is the third higher harmonic wave of the stereo pilot signal (19 kHz) as shown in Figs. 14 and 15 and is modulated with ±4 kHz which is equivalent to 5.33% of the maximum FM modulation 75 kHz.

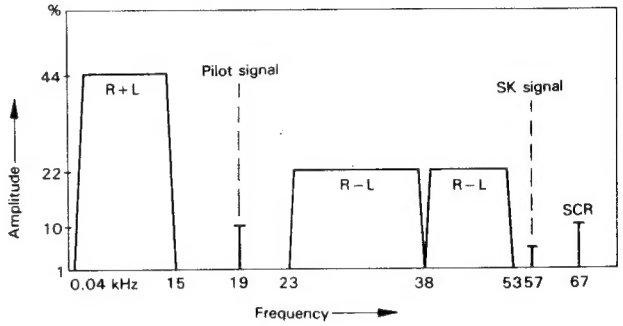


Fig. 14

Frequency spectrum of the modulated waves of FM stereo broadcast and the ARI signal

By detecting the absence/presence of the SK signal, the KRC-929D (SK system) has the following functions.

(1) If the station tuned in is a station which provides traffic information, the SK lamp lights.

(2) In this model permits only a station which provides traffic information to be auto-searched. (SK-SEARCH)

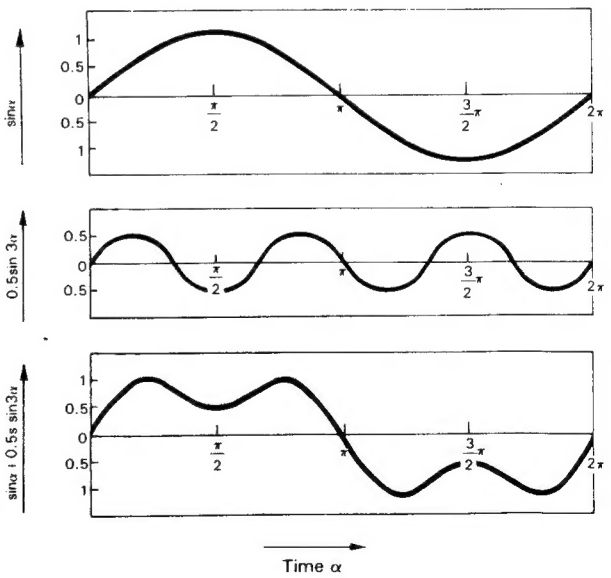


Fig. 15

Synthesized waveform of the basic wave (1.9 kHz) and 0.5 [3rd higher harmonic wave (57 kHz)]

CIRCUIT DESCRIPTION

3 DK system

The DK system is a traffic message ID system and this ID signal (125 Hz) is called the DK signal.

The DK signal uses the SK signal as a subcarrier and is AM-modulated by 125 Hz before being sent. The modulation factor is 30%.

The DK signal is sent immediately before the traffic information is broadcast until it ends.

By detecting the absence/presence of this 125 Hz signal, the DK system has the following functions.

(1) Interrupt function

Even while you are listening to a cassette tape, either the SK or DK FM broadcast is being monitored and the moment traffic information is received, the audio output is automatically switched from the tape to the FM broadcast (traffic information).

(2) Volume increase function

Once the traffic information is received, the volume is automatically increased to a certain value even if it is fully turned down. (A certain value will be 6 mV by DIN output)

4 BK system

This is an area ID system. Each broadcasting station's service area is divided into 11 traffic area blocks, to each of which letters A to F are assigned.

The 6 types of ID signal (BK signal) have an extremely low frequency and are formed by AM-modulating the SK signal.

As shown in Fig. 16, frequencies from A to F include those from 23.75 Hz to 53.98 Hz which are formed by counting down the 19 kHz stereo pilot signal. (Fig. 17)

The AM modulation factor of each BK signal is 60%.

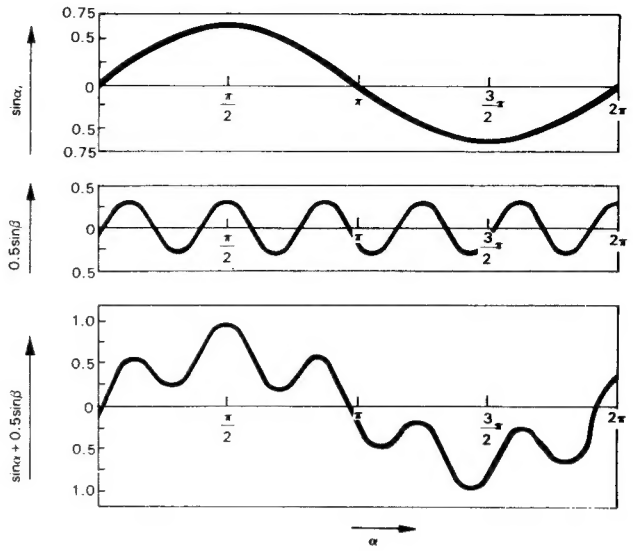


Fig. 16 Synthesized waveform of the BK signal (block A) and the DK signal

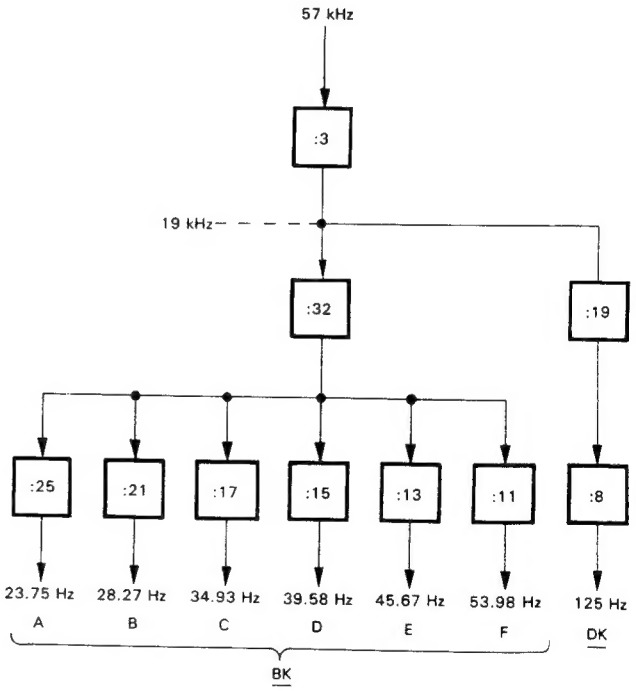


Fig. 17 Area ID (BK) signal and traffic message (DK) signal

CIRCUIT DESCRIPTION

5 ARI system

As described above, in the ARI system, all the system parameters can be obtained by either multiplying or counting down the stereo pilot signal. The feature of the ARI system is maximized when using an automatic tuning car radio (synthesizer tuner) with built-in decoders. In other words, if the SK, BK and DK decoders are in operation, search automatically stops at the preset station, allowing the user to listen to the traffic information of the given area.

If the user is going from one area to another and if the corresponding ID code key for the next area is pressed, search automatically starts when the current area's reception level lowers.

Fig. 17 shows the "flow of road traffic information" and Fig. 18 illustrates the "block divisions of traffic information in West Germany".

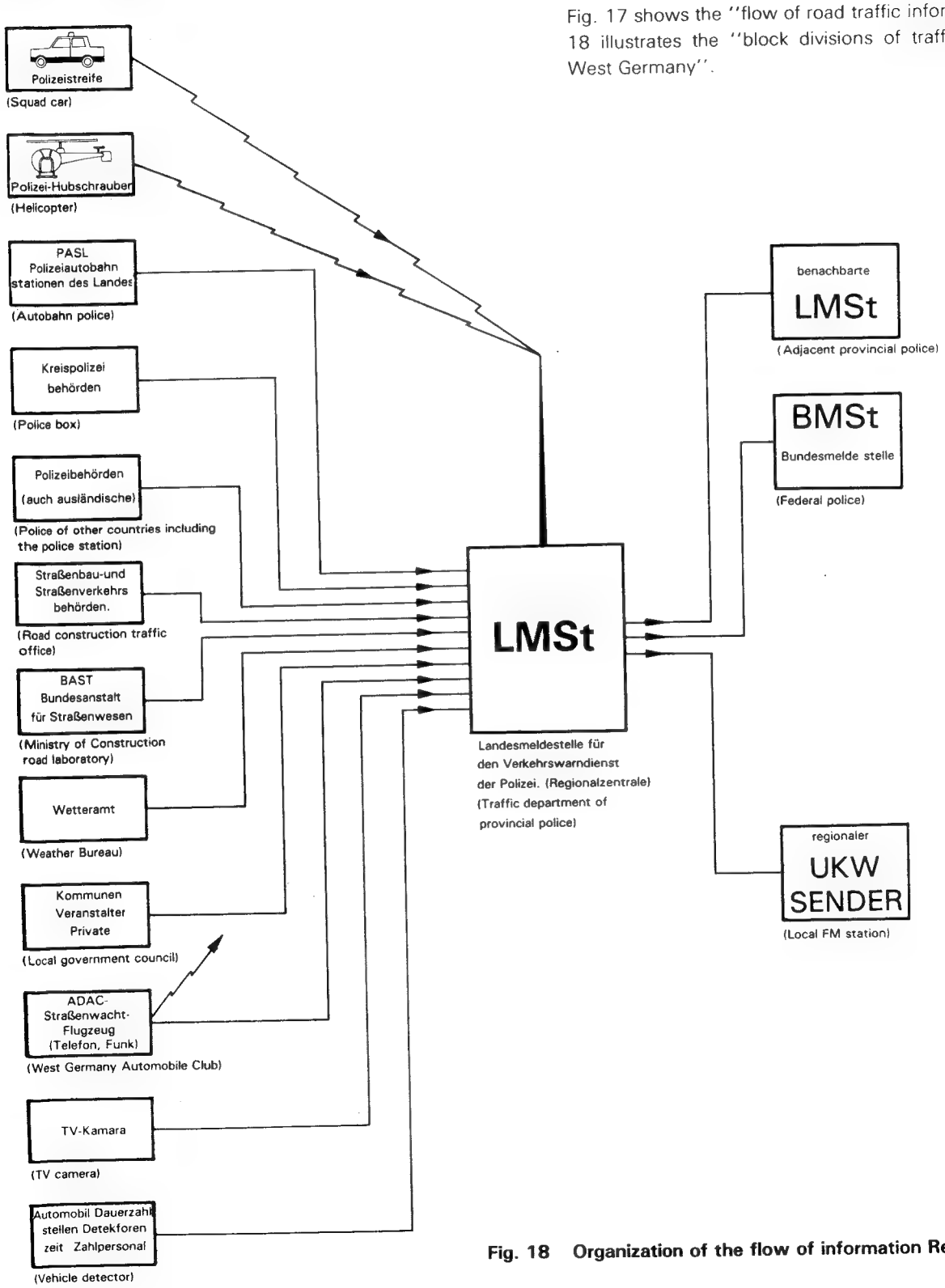


Fig. 18 Organization of the flow of information Regional structure

CIRCUIT DESCRIPTION

TRAFFIC BROADCAST AREAS AND STATIONS OF THE FEDERAL REPUBLIC OF GERMANY

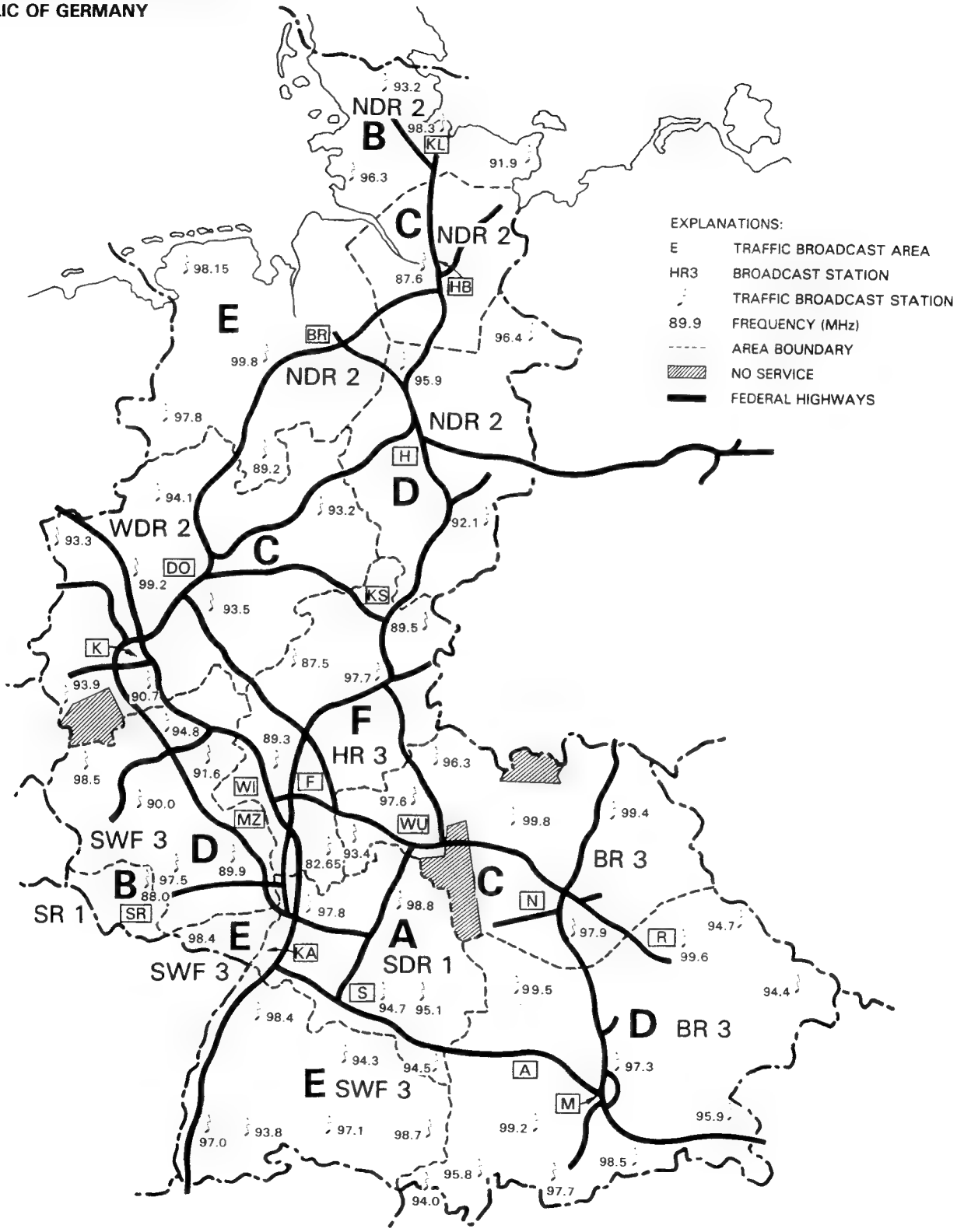


Fig. 19 Block divisions of traffic information in West Germany

CIRCUIT DESCRIPTION

BASIC OPERATION FLOW CHART

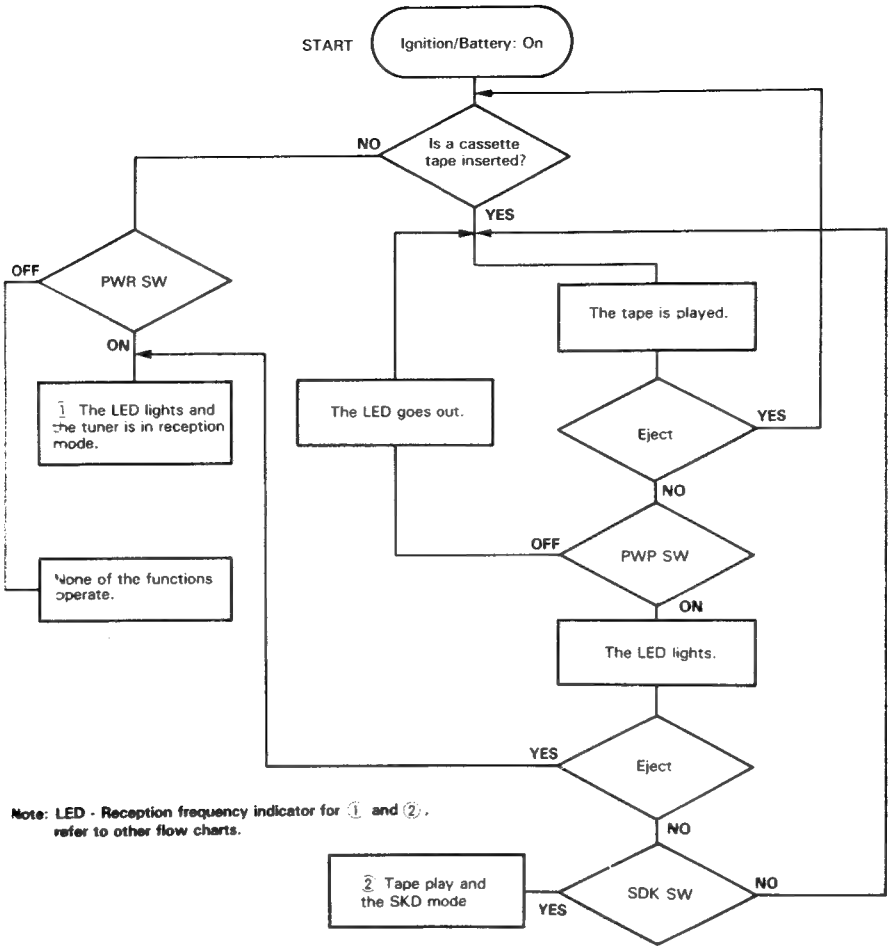


Fig. 20 Basic flow (tape and tuner)

Tuner reception mode (band switching)

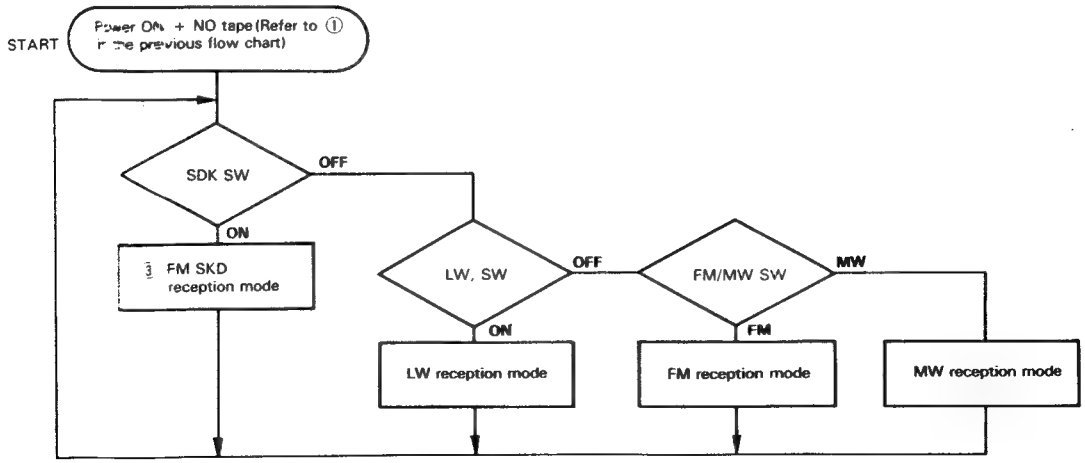
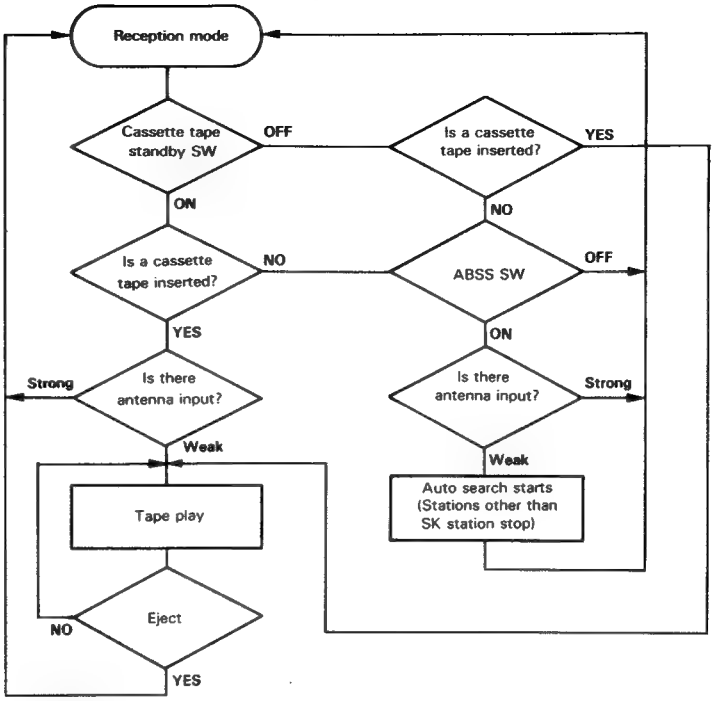


Fig. 21 Tuner mode

CIRCUIT DESCRIPTION



Although the priority is the same, the only difference is that even if the cassette standby is on, unless a cassette tape is inserted, the ABSS operates.

Fig. 22 Cassette standby and ABSS

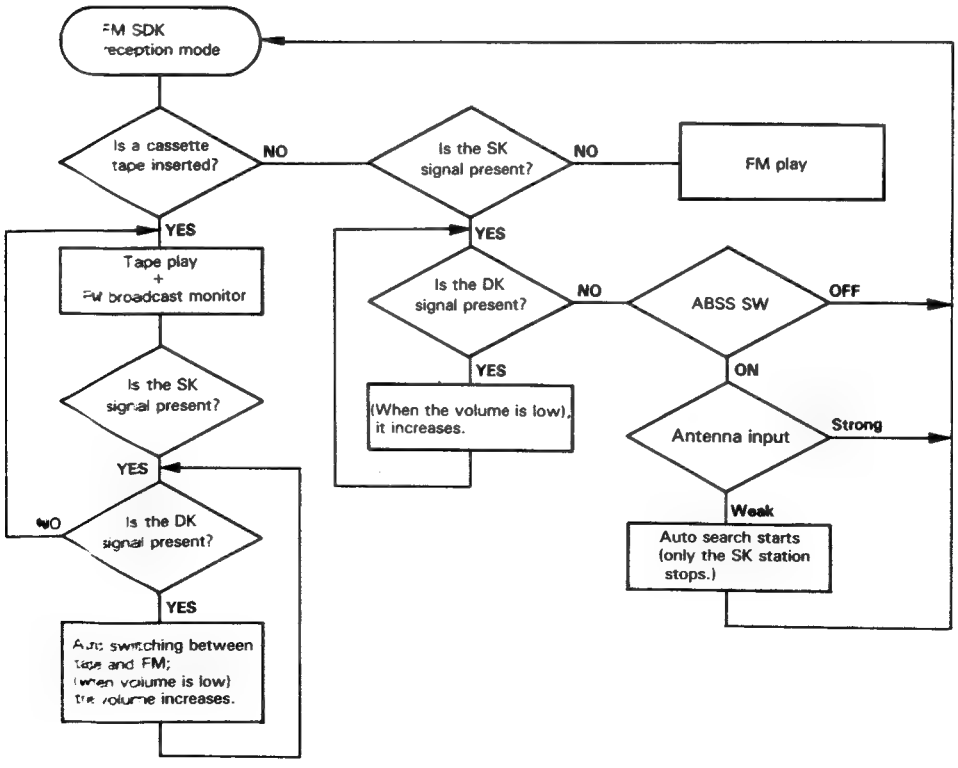


Fig. 23 SDK

CIRCUIT DESCRIPTION

DESCRIPTION OF IC1 (μPD1710G-012)

3-band PLL frequency synthesizer and controller for car stereos for Europe

μPD1710G-012 (52-pin flat package or quad-in-line package) is a tuning system LSI IC for car stereos for Europe. This IC has 3 reception bands which are including LW, MW and FM as well as decoding functions for DK and BK of ARI (traffic information).

1. FEATURES

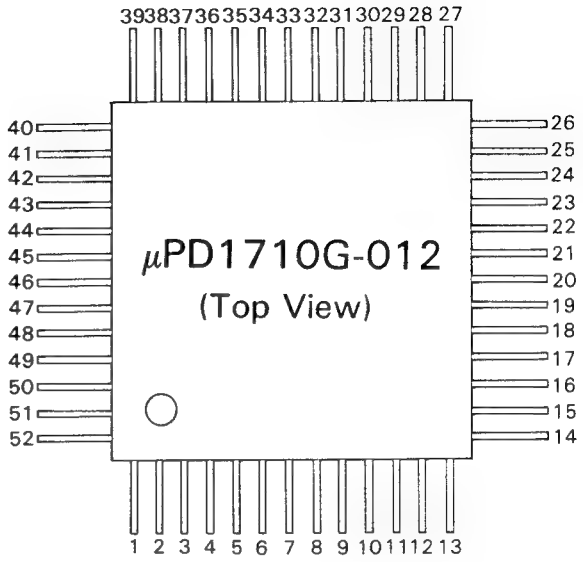
- DK and BK decoding of ARI, audio output control and display
- Preset memory of 6-stations each in 3 bands: LW, MW and FM
- 2 kHz shift of LW band
- Preset memory display
- SEEK
- Momentary band switch

Functions for ARI

1. BK and DK signal decoding
2. DK standby possible in cassette mode
3. BK search (area specified search)
4. DK standby in ARI band

2. HARDWARE CONFIGURATION

2-1 Pin connection (TOP VIEW)



No	Pin name	No	Pin name
1	D1	27	*
2	$\overline{\text{MUTE}}$	28	FM (PA1)
3	X2	29	MW (PA2)
4	X1	30	LW (PA3)
5	V_{DD}	31	Sh (PD3)
6	V_{DD}	32	ALARM (VDP)
7	V_{DD}	33	V_{DD}
8	EO1	34	Sa
9	GND	35	Sb
10	GND	36	Sc
11	EO2	37	Sd
12	CE	38	Se
13	SD	39	*
14	*	40	Sf
15	FM fin	41	Sg
16	PSC	42	K0
17	Pull up to V_{DD} ($\overline{\text{INT}}$)	43	K1
18	MW fin	44	K2
19	BK-IN (PC2)	45	*
20	DK-IN (PC3)	46	K3
21	*	47	*
22	C (PB0)	48	D6
23	A + B (PB1)	49	D5
24	AGC Cut (PB2)	50	D4
25	TAPE (PB3)	51	D3
26	ARI (PA3)	52	D2

* Not used

V_{DD} and GND are classified internally as follows.

5 CPU and port

6 Oscillating programmable counter

7 EO1 and EO2

33 Internally connected to pin 7

9 CPU, port, etc.

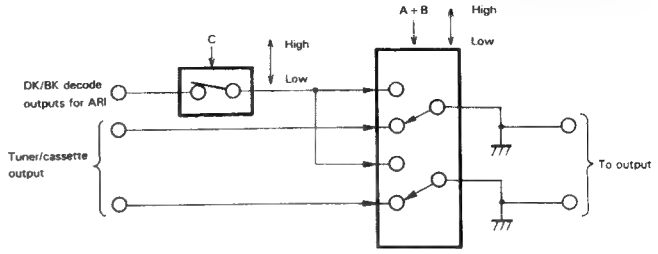
10 EO1 and EO2

*Not used

CIRCUIT DESCRIPTION

Pin number	Symbol	I/O	Pin name	Description	Active
34 - 41	Sa - Sg	O	Segment Output	Display segment signal output and key return signal source pins. (For details, see key matrix configuration.)	H
42 - 46	K0 - K3	I	Key Return Signal Input	Key return signal input pins from the external key matrix. (For details, see key matrix configuration.)	
48 - 52 1	D1 - D6	O	Digit Output	Display digit output pins.	H
2	$\overline{\text{MUTE-1}}$	O	MUTE 1	Muting output pin which mutes shock noise when the lock of the PLL is disturbed. There are two mute output pins. $\overline{\text{MUTE-1}}$ is output under the following conditions. a. When the PLL data has been changed. b. When the band has been changed c. When the output is switched between the A + B and C outputs d. When the cassette is loaded or unloaded. e. While CE pin is low. However, as long as TAPE is on, a and b are not output. (For details, see muting timing diagram.)	L
3 4	X1 X2		X'tal	Pins to which crystal oscillator is connected. A 4.5 MHz crystal is connected.	
5 6 7 33	V_{DD}		V_{DD}	Power supply pin of this device. To operate the device, a voltage of 5 V ± 10% should be supplied. To retain the internal data memory (RAM), the voltage may be lowered to 3.0 V. However, the rise time of V_{DD} should be 500 msec or less. If the rise time is extremely long, initialization may not operate normally.	
8 11	EO1 EO2	O	Error Out	Charge pump output for the phase detector which comprises the PLL. If the frequency counted down from the oscillatory frequency is higher than the reference frequency, a high level signal is output from these pins; if it is lower, a low level signal is output. Since the same signals are output to pins EO1 and EO2 at the same time, these can be connected to either AM/LW or FM/ARI LPF (lowpass filter).	
9 10	GND		Ground	System ground.	
12	CE		Chip Enable	Device's select signal input pin. To operate this device normally, this pin should be set to high; if the device is not to be used, set this pin to low level. However, input below 134 μsec is not accepted.	H
13	SD	I	Station Detector	Input pin which detects whether or not a broadcasting station has been tuned during auto tuning (auto up/down), scan tuning (scan) or BK search tuning. When a high level signal is input, auto tuning is stopped. However, it is necessary to input within 25 msec after the PLL is locked. (However, in LW band, it is necessary to input within 125 msec.)	H
15	FM	I	FM Local Oscillator Signal Input	This is an FM programmable counter input. The outputs counting down the FM local oscillator (VCO) outputs by prescaler μPB553AC by 16 and 17 are input. Since this incorporates an AC amp, the DC component is cut with a capacitor.	
16	PSC	O	Prescaler Control	If the frequency dividing system employs the pulse swallow system (in FM), this pin outputs a signal which switches the frequency dividing ratio. This pin to PSC pin of prescaler μPB553AC is connected. The frequency dividing ratios of μPB553AC is 1/16 and 1/17.	
17	$\overline{\text{INT}}$		Interrupt	Not used. Leave this pin at high level.	
18	AM	I	AM Local Oscillator Signal Input	This is a programmable counter input for MW and LW. The local oscillator (VCO) output of MW and LW is input. Since this pin incorporates an AC amp, the DC component is cut with a capacitor.	
19	BK - IN	I	BK Signal Inputs	Input pin for the area ID signal (BK signal: 23 to 57 Hz) of the ARI. One cycle is counted using 200 μsec scan pulse from the leading edge of the BK signal; using the count value, an area is judged from 6 areas A to F.	
20	DK - IN	I	DK Signal Inputs	Input pin for the message ID signal (DK signal: 125 Hz). This is judged by the number of inversions of the DK signal during approx. 360 msec.	

CIRCUIT DESCRIPTION

Pin number	Symbol	I/O	Pin name	Description	Active
22 23	C A + B	O	ARI/TUNER & TAPE Output Control	Control output pins for the DK and BK signal decode outputs of the ARI. Switching is made between the ARI broadcast and tuner/cassette output. 	
24	MUTE-2	O	MUTE 2	The muting output pin for muting the shock noise generated when the PLL lock is disturbed. MUTE-2 is output in the following mode: a. Auto tuning	H
25	TAPE	O	TAPE	Output pin in tape mode. This pin goes high when the alternate type cassette switch is turned on.	H
26 28 29 30	ARI FM MW LW	O	ARI FM MW LW	Output pins for MW/LW/FM and ARI bands. Each signal output corresponding to the select key of each band. However, in tape mode, the MW, LW and FM band signals are not output.	H
31	SEG-h	O	Segment h Output	Segment output pin for display. This is used for displaying segments of 50 kHz, decimal point, colon and memory. (For details, refer to display section.)	H
32	ALARM	O	ALARM	Not used.	H

2-2 Outline of functions

(1) Reception frequency

Band	Frequency range	Channel space		Reference	IF
		Manual	Auto		
MW	531 ~ 1602 kHz	9 kHz	9 kHz	9kHz	+ 450 kHz
FM ARI	87.50 ~ 108.00 MHz	50 kHz	50 kHz	25 kHz	+ 10.700 MHz
LW (LW-1 ~ LW-4)	*153 ~ 281 kHz	1 kHz	9 kHz	1kHz	+ 450 kHz

***Note:** **In manual operation using the LW band, the frequency counts up or down with a channel space of 1 kHz within the frequency range given above. However, in auto scanning operation, the frequency stops at the following four frequencies as preset by the initial setting switch.**

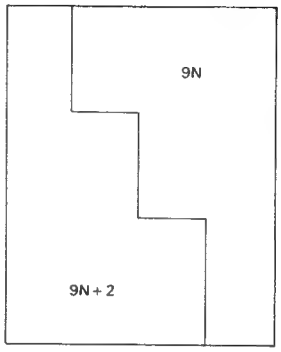
CIRCUIT DESCRIPTION

* Frequencies at which SEEK stops in LW band

Band	LW-1	LW-2	LW-3	LW-4	*1 CH NO.
Frequency (kHz)	155	153	153	153	00
	164	162	162	162	10
	173	171	171	171	20
	182	180	180	180	30
	191	189	189	189	40
	200	200	198	198	50
	209	209	207	207	60
	218	218	216	216	70
	227	227	225	225	80
	236	236	234	234	90
	245	245	245	243	A0
	254	254	254	252	B0
	263	263	263	261	C0
	272	272	272	270	D0
	281	281	281	279	E0

L-1	L-2	BAND
1	1	LW-1
1	0	LW-2
0	0	LW-3
0	1	LW-4

L-1, L-2; For details, see key-matrix configuration. (Service compatible)



*1 The first digit of the channel number is 1/9 counter.

- The right side is a multiple of 9.
- The left side is a multiple of 9 plus 2.

(2) Tuning functions

1 Manual tuning (sawtooth wave mode)
(UP and DOWN keys) Each time this key is depressed, the frequency counts up or down by 1 step; if it is held depressed for approx. 0.4 sec or more, rapid advance is enabled.

2 SEEK (sawtooth wave mode)
(SEEK key) If this key is depressed, the frequency is automatically counted up. In the case of LW, MW and FM bands, if the SD pin goes high, it is taken that tuning has been made, and the station is held. In the ARI band, SK seek results; if the SD pin and count enable pin go high, it is taken that tuning has been made, the BK signal permits the area to be displayed and the tuned station is held.

3 Recalling the preset memory (in LW, MW and FM bands) (M1, M2, M3, M4, M5 and M6)
Six stations each can be preset for the LW, MW and FM bands individually. For example, if the M1 key is depressed in MW mode, the MW frequency stored in the M1 key can be called up. The same thing can be applied to the LW and FM bands, the frequency in each mode can be recalled.

4 Recalling the preset memory (the ARI band only)
(Keys required: A, B, C, D, E and F)
One station each can be preset for each area. For example, if the A key is depressed, the frequency of area A can be recalled. Likewise, for B to F keys, the frequency of each area can be recalled. If the same key as the display area is depressed, BK seek starts and the area specified auto tuning results.

(3) ARI functions

The ARI is a traffic information broadcast in West Germany. It is inserted in the regular programming one to four times per hour for a duration of several tens of seconds to a few minutes. The frequency used is from 87.5 to 108.0 MHz in the FM band. ARI is a multiplex broadcasting using 3 signals consisting of the SK signal (broadcasting station ID signal), BK signal (area ID signal) and DK signal (message ID signal).
The μPD1710G-012 checks these three signals, SK, BK and DK, using its software to provide the following functions.

1 SK search (the display momentarily disappears for BK signal check when search is stopped).
To listen to traffic information, a station which transmits the SK signal should be found (SK search); upon finding, you should wait for the traffic information to start (auto tuning in the ARI band).

2 BK search
To listen to the area specified traffic information, a station which transmits the SK signal should be found, then it should be checked whether the area is the required area or not. (Refer to 2-2 (2) 4 .)

3 DK standby
This mode is used when you do not want to listen to a broadcast until the traffic information starts or when you want to listen to a cassette tape and automatically switch over to the traffic information broadcast as soon as it begins (125 Hz input to the DK-IN pin). The DK signal is being checked at all times.

CIRCUIT DESCRIPTION

(4) Checking methods of the SK signal, BK signal and DK signal

1 SK signal: The signal which identifies a station which broadcasts traffic information. The current state of SK signal is input at all times through. (For details, refer to the circuit description.)

2 BK signal: In West Germany, localized traffic information is provided. For this reason, the area identification (ID) is given. Using 6 frequencies between approx. 20 to 50 Hz, the entire West Germany is divided into 13 areas assigning the 6 frequencies so that the adjacent region does not have the same identity to provide a more sophisticated service.

The precise frequencies of the BK signal in each area are as follows.

A = 23.7500 Hz
B = 28.2738 Hz
C = 34.9265 Hz
D = 39.5833 Hz
E = 45.6731 Hz
F = 53.9773 Hz

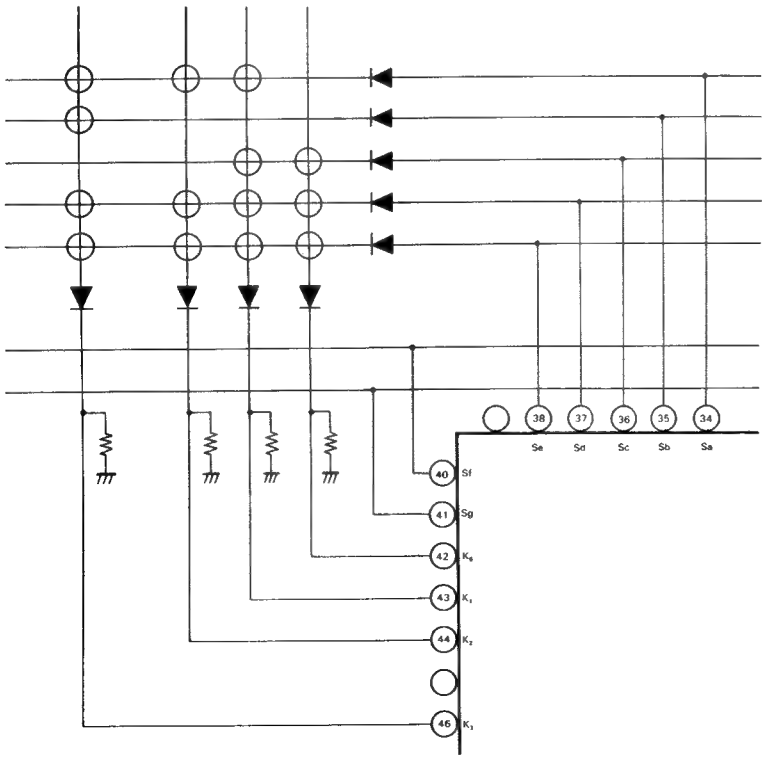
2-3 Key configuration

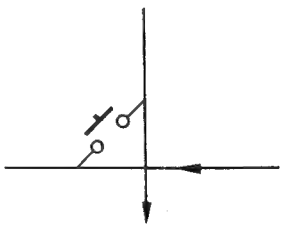
(1) Key matrix arrangement

Input pin / Output pin	K_3	K_2	K_1	K_0
SEG a	① MANUAL UP	② MANUAL DOWN	③ MEMORY ENABLE	—
SEG b	④ SEEK	—	—	—
SEG c	—	—	⑤ MEMORY Ⓐ (M1)	⑥ MEMORY Ⓑ (M2)
SEG d	⑦ MEMORY Ⓒ (M3)	⑧ MEMORY Ⓓ (M4)	⑨ MEMORY Ⓔ (M5)	⑩ MEMORY Ⓕ (M6)
SEG e	⑪ LW	⑫ MW	⑬ FM	⑭ BK
SEG f	—	—	—	—
SEG g	Service compatible (L-1)	Service compatible (L-2)		—

Types of keys
①-⑭ : Momentary switches

(2) Connection of key matrix and switch format





Momentary switch

key input

CIRCUIT DESCRIPTION

(3) Key switch functions

① Manual up key: S20 (UP)
This is a manual tuning key; each time this key is depressed, the frequency counts up by 1 step. If this key is held depressed for 0.4 sec or more, the frequency counts up in rapid advance at a rate of approx. 30 ms until the key is released.

② Manual down key: S19 (DOWN)
This key is the same as ① above except that this key counts down instead of up.

③ Memory enable key: S8 (M)
This mode is used when writing a new frequency into the memory. When this key is depressed, the M lamp lights; while it is lit (for approx. 5 sec), if any key M1 (A) to M6 (F) is depressed, the frequency being displayed at that moment is written into the memory. Once it is written, the M lamp goes out.

④ SEEK key
This is an auto tuning key. If this key is depressed, the frequency seeks in the count up direction, and if the SD pin goes high, the frequency is held. However, it is necessary for the level to go high within 25 ms after the PLL is locked (in the case of LW band, within 125 ms). In the BK band, SK seek results; if the SD pin goes high, and the count enable pin goes high, the frequency is held. The area is displayed using the BK check and the last memory is updated.

⑤ - ⑩ M1 to M6 (A to F)
These are preset memory keys; a single key corresponds independently to the MW, LW, FM band and BK area identification frequency memories. Thus a total of 24 stations can be written into the memories and 6 for access only.
To call-up:
For example, if the M1 Ⓐ key is depressed in each band, the frequency stored in each band can be recalled. If the same key as the displayed area Ⓐ to Ⓕ is depressed in the BK band, area specified auto tuning in the count up direction results (BK search).
To store the frequency into the memory:
After the M key ③ is depressed, if any key M1 Ⓐ to M6 Ⓕ is depressed while the M lamp is lit (approx. 5 sec.), the frequency being displayed at that moment is written into the memory.

⑪ - ⑭ LW, MW, FM and BK
These are switches to switch the reception bands. The mode changes as follows depending on the state of the initial switch (band switch).
If any key LW, MW, FM and BK is depressed, the reception band switches over to the band corresponding to the depressed key. (band switch = 0)

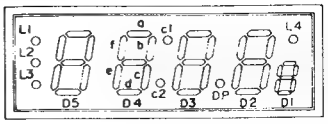
CIRCUIT DESCRIPTION

2-4 Description of the display

(1) Display matrix

The frequency is indicated in the 4-digit (numerals) 8-segment display.

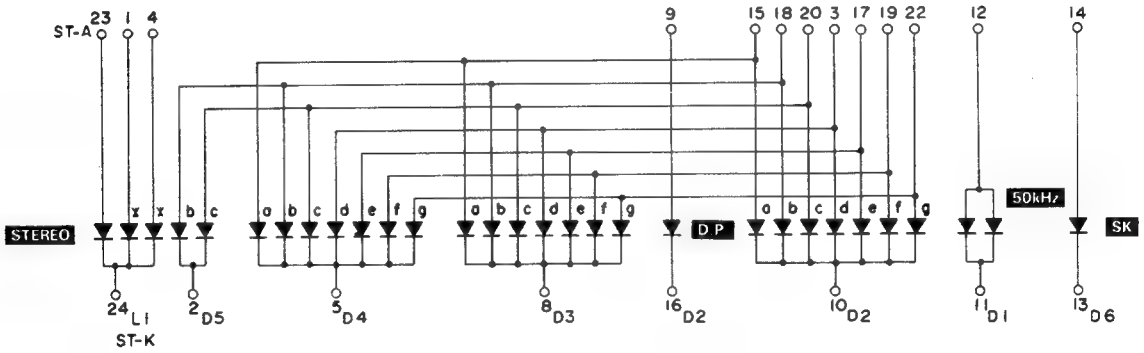
The display element is connected as shown above. (a_1 -g_1 and a_4 - g_4 each correspond to Sa to Sg.)



Pin connection

Pin No.	Address			Pin No.	Address		
1	L3	Anode	*	13	L4	Cathode	
2	D5	Common Cathode		14	L4	Anode	
3	d	Anode		15	a	Anode	
4	L2	Anode	*	16	Dp	Cathode	
5	D4	Common Cathode		17	e	Anode	
6	N.C.		*	18	b	Anode	
7	N.C.		*	19	f	Anode	
8	D3	Common Cathode		20	c	Anode	
9	Dp	Anode		21	N.C.		*
10	D2	Common Cathode		22	g	Anode	
11	D1	"5"	Cathode	23	L1	Anode	
12	D1	"5"	Anode	24	L1, L2, L3	Common Cathode	

***...not connected.**



(2) Description of display

(1) (a_1 - g_1) to (a_4 - g_4)
The frequency is indicated. When the highest digit (D_4) is zero, the indication is blank.

(2) FM, MW, LW and BK
These indicate the reception band. During FM band reception, 'FM' is lit.

(3) M1Ⓐ to M6Ⓕ
During FM, MW and LW band reception, each of these is lit corresponding to the depressing of any one of M1Ⓐ to M6Ⓕ keys (⑤ to ⑩). When the frequency is changed using the DOWN, UP or SEEK key, the display becomes blank.

(4) A to F
During BK band reception, the BK signal area is indicated.

(5) 50 kHz
When indicating the frequency in the FM or BK band, this 50 kHz indication is used.

(6) DP (Decimal point)
When indicating the frequency in the FM or BK band, this decimal point is lit in the MHz indication.

(7) ME (Memory enable): M
When indicating the frequency, this is lit for approx. 5 seconds after the M key is depressed. (It lights when the preset memory is possible.)

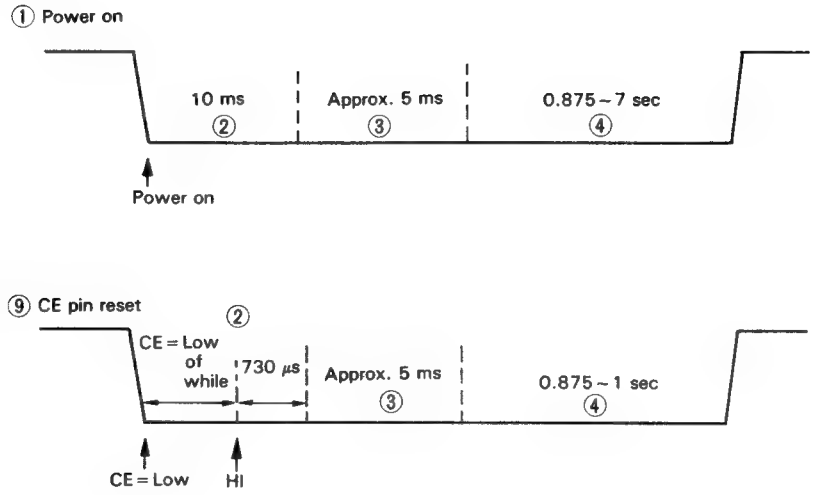
(8) SK
This lights when the SK signal is present in the ARI band.

CIRCUIT DESCRIPTION

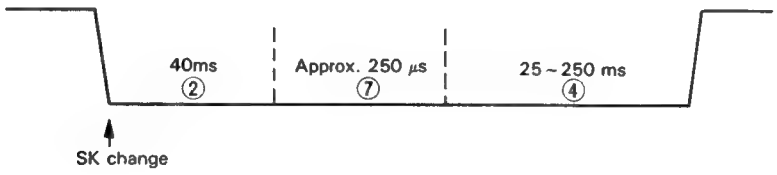
Mute timing diagram

① Key-on chattering time
② Mute initial time
③ Setting of frequency dividing ratio and updating time of the display contents
④ Mute initial time
⑤ Key scan time
⑥ PLL lock time
⑦ A + B, C (PB_0, PB_1) transition time
⑧ Timer time at range out.
⑨ Wait time

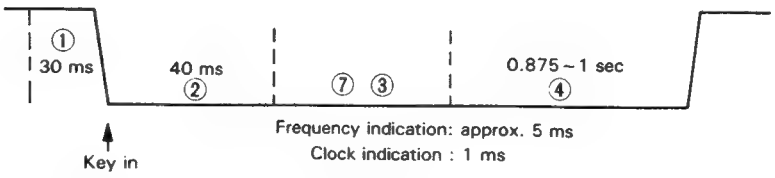
(1) In the case of reset



(2) In case the DK signal has varied (DK standby ⟶ ARI broadcast) switching between A + B and C

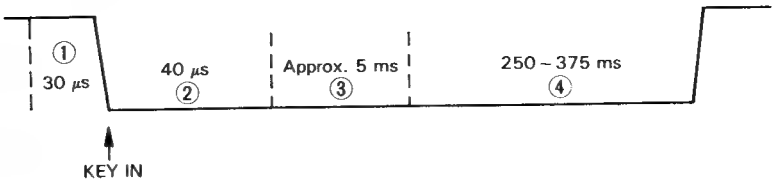


(3) In the case of cassette IN/OUT (ALT IN)

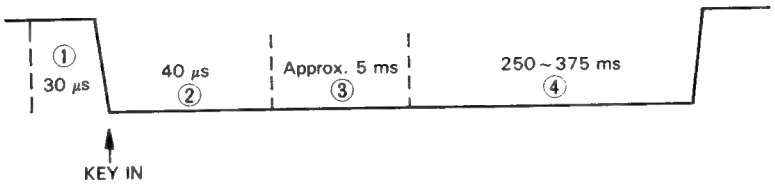


CIRCUIT DESCRIPTION

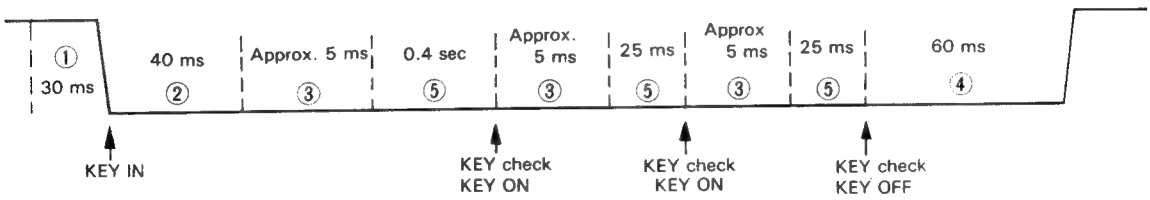
(4) In case the band has been switched (KYDECD)



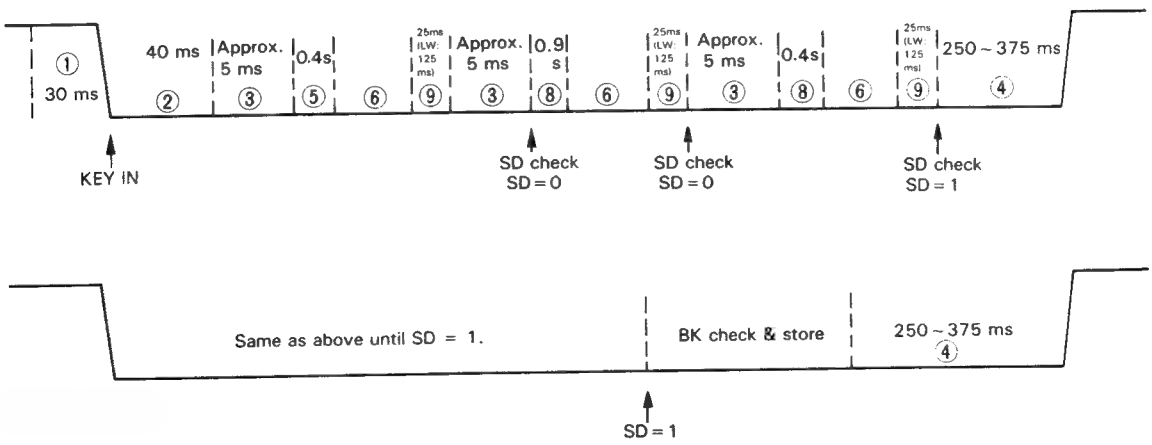
(5) In the case of reading to M1 Ⓐ to M6 Ⓕ



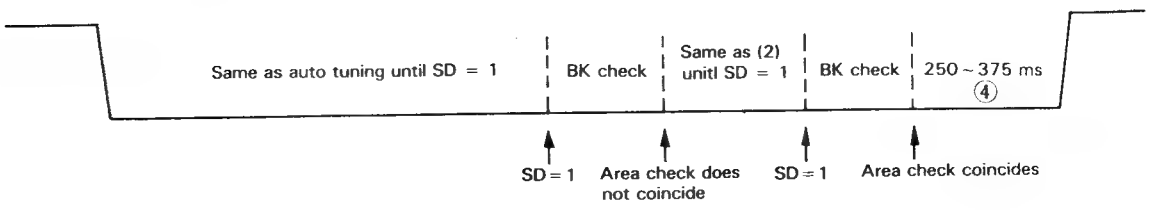
(6) In the case of manual tuning (DOWN, UP)



(7) In the case of auto tuning (SEEK)

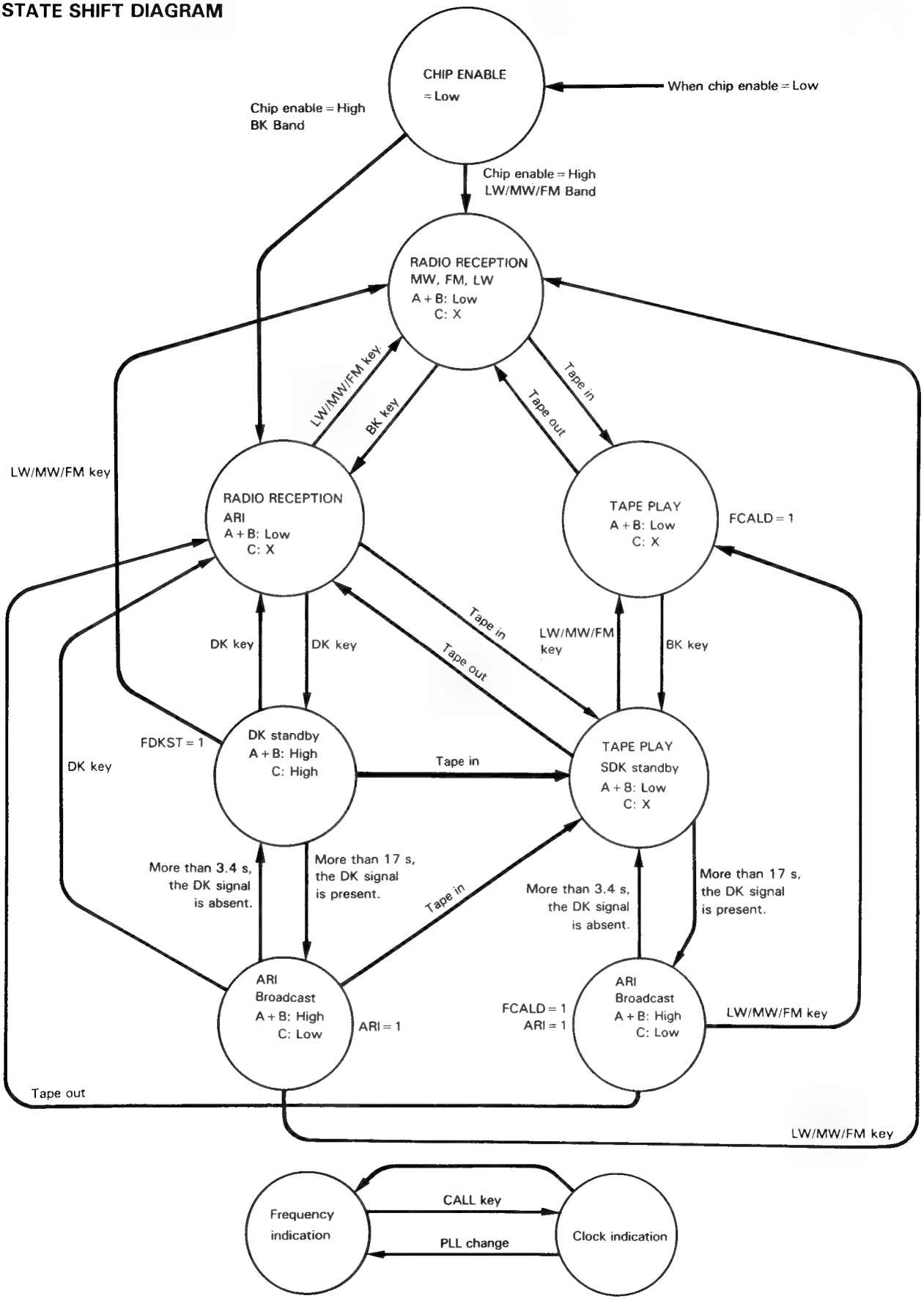


(8) In the case of BK seek (A to F keys)



CIRCUIT DESCRIPTION

3. STATE SHIFT DIAGRAM



CIRCUIT DESCRIPTION

MUTING SYSTEM

1. Muting during operation

During operation, the muting signal is generated by A/4, B/4 of IC12 (μPD4081BG). Q50 works almost in the same way as Q48, described before under the title "analog switch control system". The collector of Q50 is low level in TAPE mode and becomes high level in TUNER mode, and a high level signal is applied to IC12 (B/4), pin 5. On the other hand, Q49 turns on and a low level signal is applied to D15 to turn it off, but D15 is turned on when the muting signal of low level is supplied from IC1 (μPD1710G-012), pin 2 (MUTE: Active low) to the base of Q58 to turn it on. Then, a high level signal is applied to IC12 (B/4), pin 6, both the above mentioned pins 5 and 6 become high level, a high level signal is output from pin 4, and thereby D14 is turned on resulting Q92 or 91 to turn on for MUTE (active high) output.

1-1 Audio mute during TAPE to TUNER switching

During tape mode, Q49 is off and C76 is charged through R144. However, when the mode is changed to tuner mode, Q49 turns on, but as the potential charged before in C76 lowers with time constant, the output of IC12 (B/4) is held at high level, executing the mute operation until the potential becomes equal to Vth (threshold voltage) of the IC.

1-2 Audio mute during TUNER to TAPE switching

During tuner mode, C74 is charged through R143. The charged potential lowers with time constant when the mode is changed to tape mode. While this potential is lowering to Vth of the IC, the output of IC12 (B/4) is held at high level, executing the mute operation.

1-3 Mute in TAPE mode

In tape mode, the output of IC12 (A/4) is controlled by the output of D16, as explained in 1-2. The tape mute signal is supplied from the mechanism to D16 through R152. The mute operation is executed by this input signal. C75 works to prolong the mute operation in tape mode.

1-4 Muting signal from the analog switch (IC6, pin ⑩)

Pin ⑩ of IC6 (TK10320-1) is an output terminal of the muting signal which is generated during switching between TAPE and TUNER mode described in 1-1 and 1-2 above.

This signal is one of the application IC6 has itself.

The muting signal mentioned in 1-1 ~ 1-4 above is applied to the base of Q92 through respective diode OR, thereby Q92 and Q91 are turned on, the signal is transmitted to X14-1682-70 (C/3) MK6 through D1 of the diode OR, and the muting transistors Q106 and Q107 are turned on by this signal, executing the muting operation.

1-5 Muting at power off

When the power switch is turned off in tuner mode, Q48 is off as previously described, the collector is at high level, the voltage of "On B" lowers, and Q64 turns off through D83. Thus, the high level collector of Q48 turns on the diode OR D77 to turn on Q92 and Q91 mentioned before, thereby executing the muting operation.

1-6 Muting at key off

When the ignition key is turned off, and the power supply voltage lowers, D87 is pulled to turn on Q93. With Q93 turned on, a high level signal is applied to one side of the diode OR D1 to turn on Q106 and Q107 of X14-1682-70 (C/3) MK6 as explained before, thereby executing the muting operation.

The diode OR D1 controls the muting transistors according to the above mentioned conditions.

The capacitor C1 is used to cut noise.

CIRCUIT DESCRIPTION

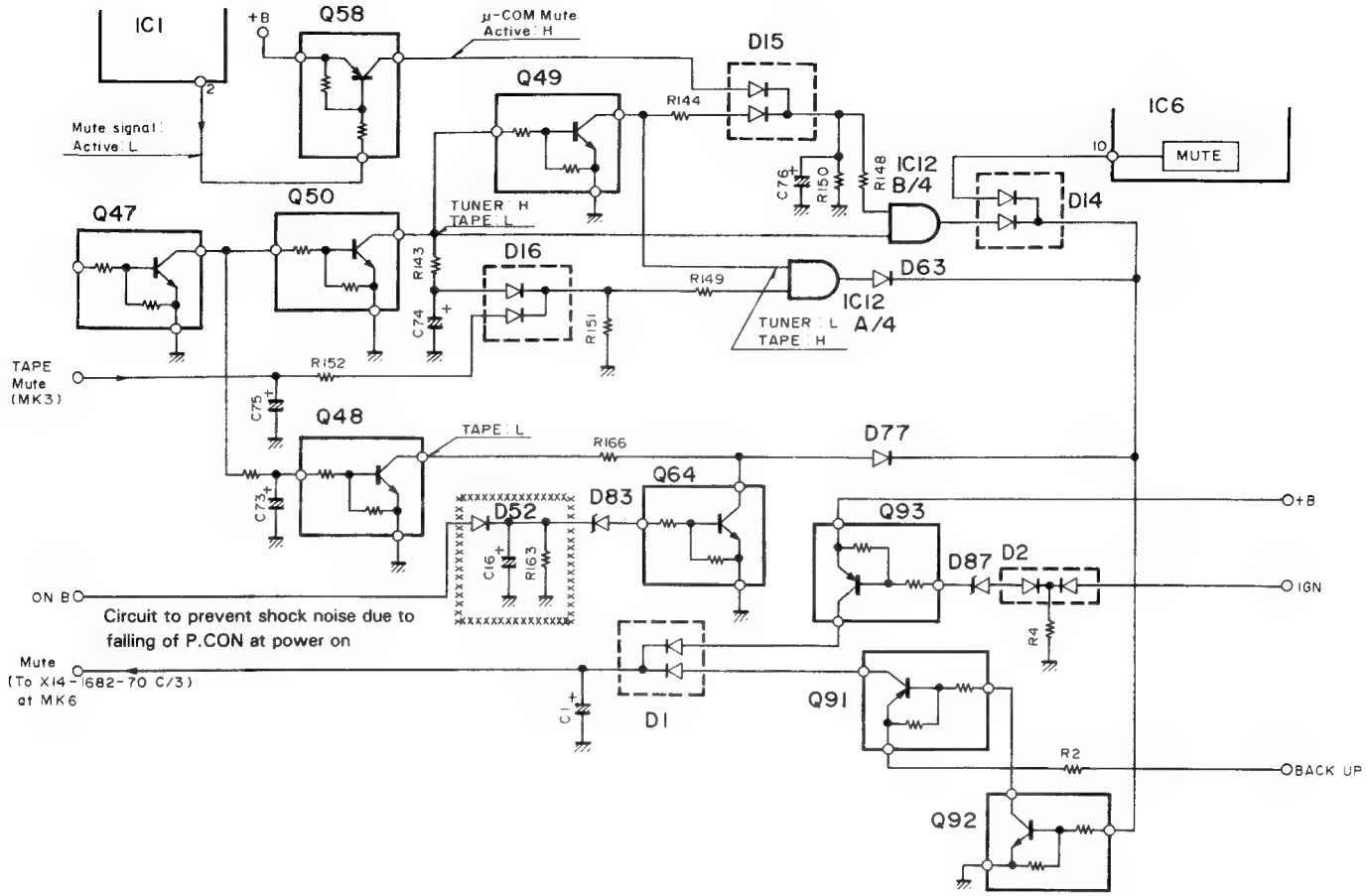


Fig. 24 Muting Circuit

CIRCUIT DESCRIPTION

Analog switch control system

Audio output control for each circuit is made by IC6 (TK10320-1). When a low level signal is applied to either one of pins 1 -3, correspondent audio signal is output.

Pin 1: Tape playback Pin 2: FM BK
Pin 3: MW, LW

1. Radio

As the + B power supply of TAPE is low level, Q48 is turned off and a high level signal is applied to IC6, pin 1 and Q50 and Q49 are turned on and a low level signal is applied to D12 and D13. Since the pins 2 and 3 of IC6 are active low, the input which makes the condition of the remaining diode of each pair low level becomes valid.

For example, in LW/MW mode, any one of LW and MW becomes high level, the outputs of D8 and D12 become high level, and a high level signal is applied to IC6, pin 2. As a low level signal is applied mutually to D13, pin 3 of IC6 becomes low level and, as described above, the audio signal for MW and LW are selected for output.

2. Tape playback

The + B power supply for TAPE becomes high level, Q48 turns on, and pin 1 of IC6 is set to low level.

Q50 turns on and Q49 turns off, and the outputs of D12 and D13 are applied to pins 2 and 3 of IC6 at high level. Therefore, pin 1 is set to tape playback mode.

3. Tape/Radio

Basically, the same as in tape playback, except that the modes are switched by the logical circuit, D61 and D17. D61 goes to high level when the volume increase for DK reception, Q47 turns on, Q48 turns off, pin 1 of IC6 is set to high level, and the mode is changed from tape to radio. D17 goes to high level in cassette standby mode or during FF or REW mode with the T-call switch turned on, and works to change the mode from tape to radio, like D61. They change the mode from tape to radio and vice versa according to ON/OFF of Q48.

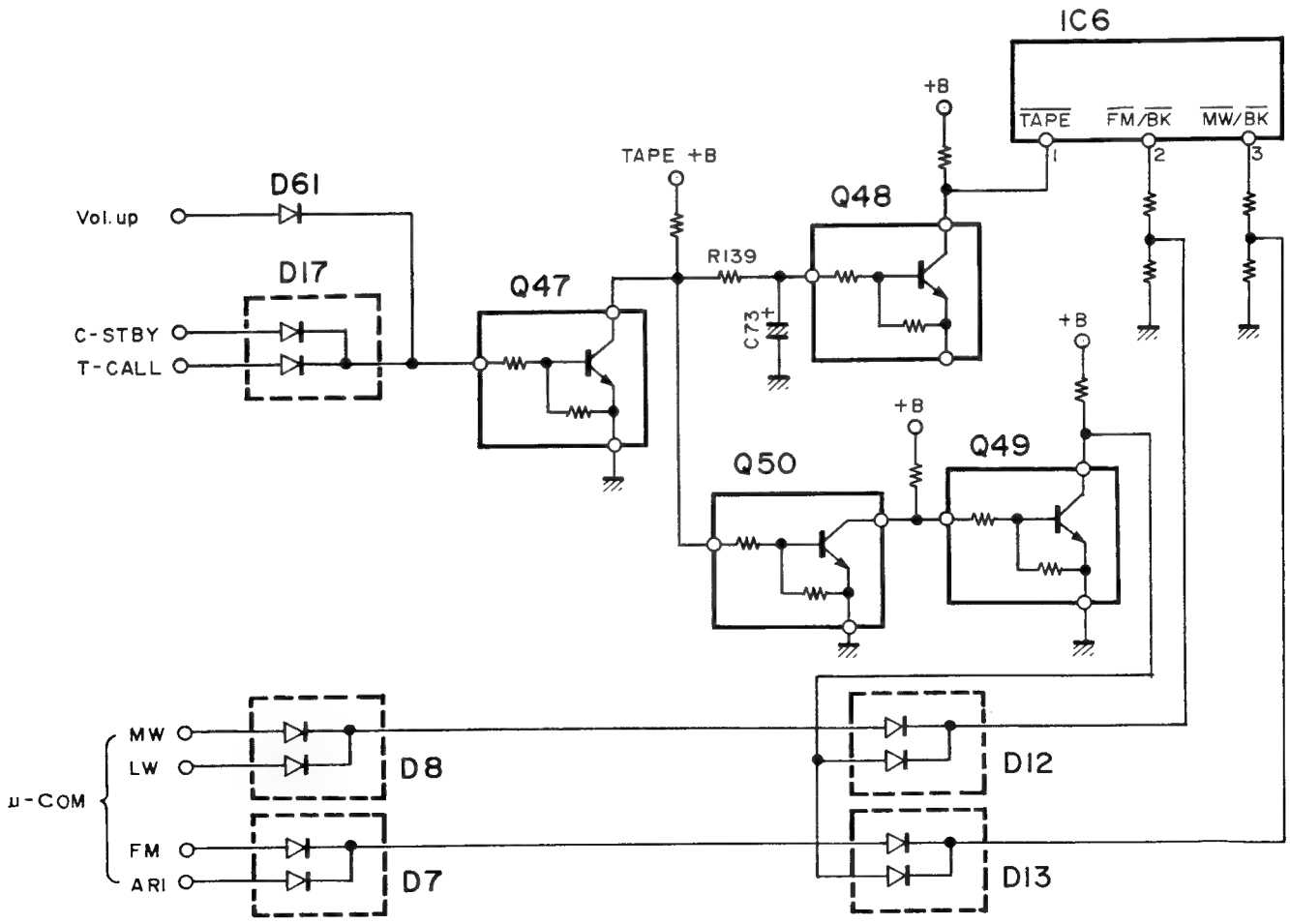


Fig. 25 Analog Switch Circuit

CIRCUIT DESCRIPTION

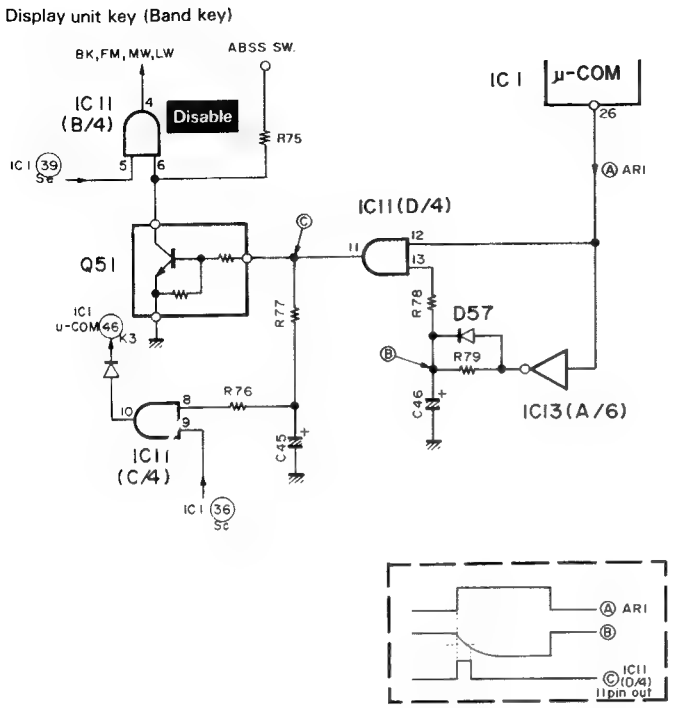


Fig. 26 DK-standby Circuit

DK-standby

When the DK signal is received in BK band mode, an interrupt occurs and the volume level is increased.
To execute this DK standby function, you need first to set and hold the microprocesser in the DK standby mode by operating the corresponding key matrix of the microprocesser.
The pulse used as a key matrix input for this function is generated by the circuit shown in Fig. 26.
Refer also to the timing diagram (page 21).

When the BK band key is pressed, ARI signal at pin ㉖ of microprocesser IC26 rises as shown in the waveform A. The pulse to turn on the DK-standby function uses the band key disable signal which is generated to prevent misoperation of the band key.
As soon as the ARI signal (Ⓐ) rises, IC11 (D/4), pin ⑪ is set to high level to turn Q51 on, disabling the band key connected before it.
At the same time, the band key disable pulse (Ⓒ) delayed by R77 and C45 is used to hold the DK-STBY on state in BK band mode. Although DK-STBY exists on the display matrix, it is not used for the KRC-929D.

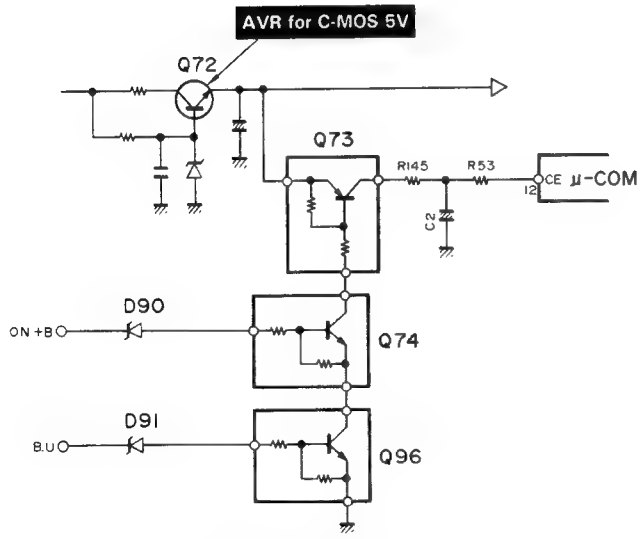


Fig. 27 CE Circuit

CE (Chip Enable)

CE needs to rise after V_{DD} at power on and fall before V_{DD} at power off in order to prevent malfunction of the microprocesser IC1 (μPD1710G-012).
Therefore, the CE line is controlled by Q74 (for detecting ON + B) and Q96 (for detecting Back-up) to meet the above conditions at power on/off, back-up on/off, etc.
The time constant of C2 and R145 is determined so that CE rising is delayed at power on.

CIRCUIT DESCRIPTION

VOL up (Volume up operation)

The signal (logic) to execute the volume up operation explained below is controlled by the DK signal sent into the microprocesser IC1.

When the DK signal is applied to pin 20 when in BK band mode, A + B (pin 23) becomes high level and C (pin 22) becomes low level. These two logical values are added to Q43, and the output signal is used for audio output selector, changing a stereo signal to monaural, volume level increasing in the preamplifier (IC25) and mixing.

As the volume increase signal output from X14-1682-70 (C/3) is active low, it is once inverted by Q94. Q95 works to increase the volume as well as switching the current source to the traffic information, and makes level weighting.

The VOL up signal from the tone control unit enters X13 C/3 without going through the coupling capacitor. The signal is applied to drains of Q109 and Q108.

When the DK signal is entered in this state, Q110 turns on, a high level signal is applied to the gates of Q108 and Q109, and the audio signal is applied to the input terminal of the operational amplifier IC25, resulting the semi-fixed volume level output for traffic information to be sent out.

The extent of volume increase can be adjusted by the semi-fixed VR5 of the tone control unit.

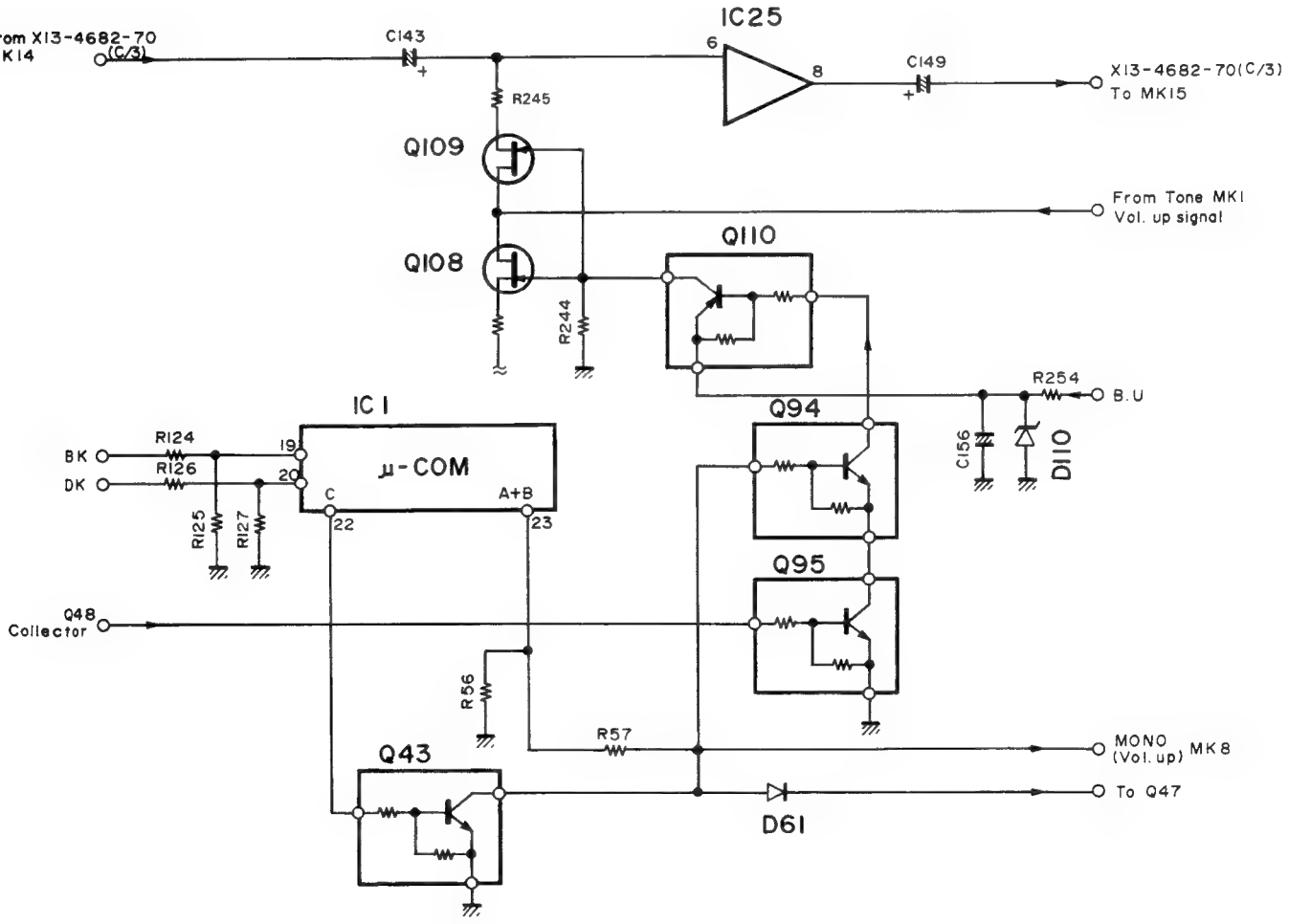


Fig. 28 VOL Up Circuit

CIRCUIT DESCRIPTION

SD (Station Detector)

The function which detects whether or not a broadcasting station has been tuned during auto tuning (auto up/down), scan tuning (scan) or BK search tuning.
When a high level signal is input to the microprocessor (pin 13), auto tuning is stopped.

1. AM

The signal generated at the SD out of IC1, pin 16 in the MW/LW front end normally low level is adjusted by VR1 and inverted by Q5 and is applied to D51. D51 and Q4 turn off in receive mode, thereby the collector is set to high level and a high level signal is applied to the microprocesser IC1, pin 13, stopping the tuning operation.

2. SK

This becomes valid only in BK band mode, utilizing the FM output of the microprocessor. In FM band mode, Q7 turns on to turn off D53, and Q4 turns off.

3. FM

The signal generated at the S-meter out of IC21, pin ⑮ in X14-1682-70 (B 3) is adjusted by VR2, and the signal applied to the base of Q8 in X14-1682-70 (A/3) is inverted there and applied to D54. When tuned, Q8 turns on and D54 off. Q4 turns off, too, and the collector is set to high level, stopping the auto tuning is executed by the microprocesser IC1.
Q9 turns on during seeking when the local switch turns on, and it turns on in tape mode when the C-STBY switch turns on, thereby making Q8 difficult to turn on.

(FM muting)

In 3 "FM" above, the signal generated at the S-meter out rises rapidly in voltage to make SD signal high level and may cause malfunction to stop auto tuning if a strong station exists at a close frequency. To prevent such malfunction, the small voltage generated at the MUTE terminal of IC21, pin 14 is applied to the base of Q11 to prevent occurrence of a malfunction of the SD logic. The reason why Q11 does not use the diode OR (D51-D54) is that in order to the SD terminal is set to low level with even a small muting voltage.

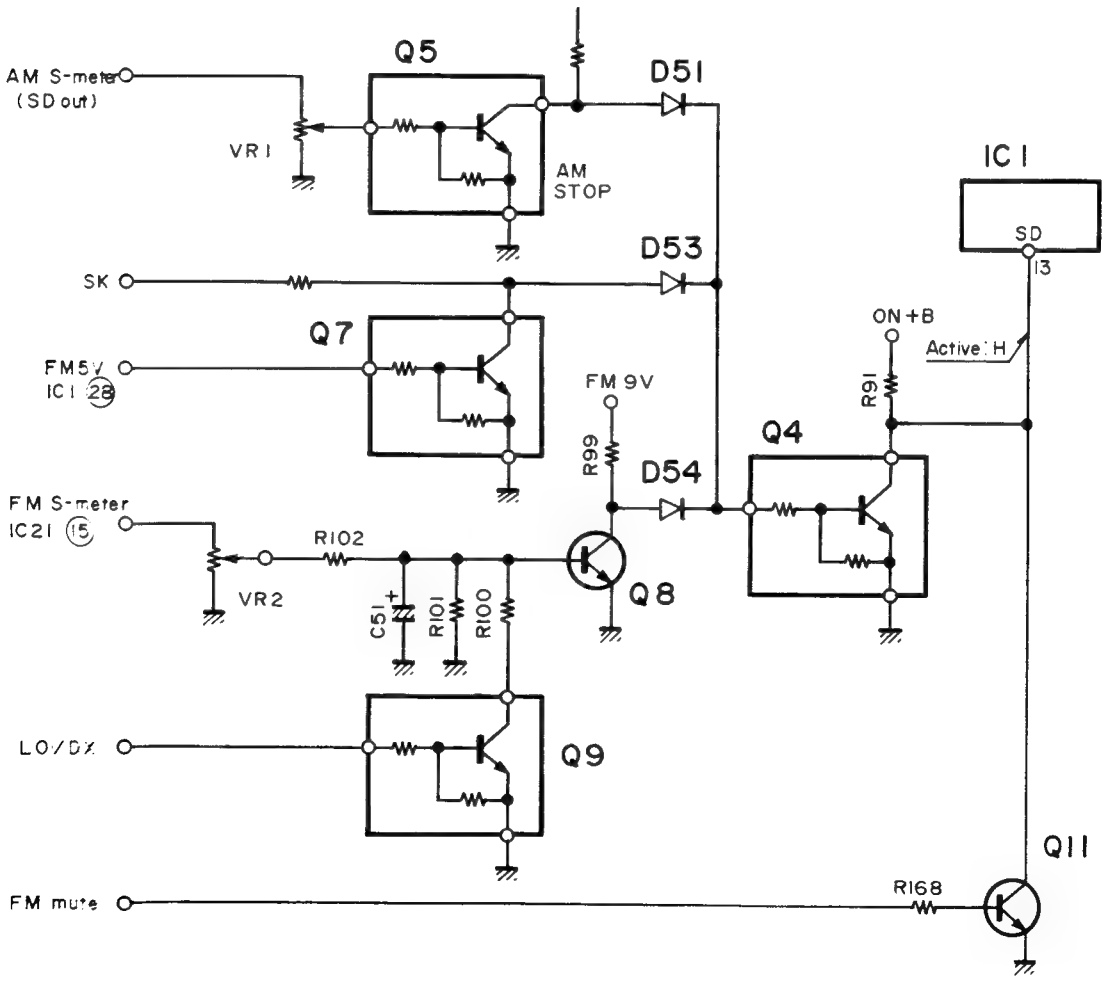


Fig. 29 SD Circuit

CIRCUIT DESCRIPTION

ANRC (Automatic Noise Reduction Circuit)

1. Blend

The signal level (signal meter out) of IC21, pin 15 is applied to IC24, pin 8 through R225, C131, D102, R224, R222 and C128.

<MONO operation at VOL up>

Q43 in X14-1682-70 (A/3) turns off when the DK signal enters, and the high level signal at the collector is applied to D103 through the connector MK8 to turn on Q105.

<MONO operation at poor receiving condition>

When a multipath occurs as the receiving condition becomes poor, a noise is output from IC23, pin 11. This noise output is used to turn on Q105 through D104, making blend.

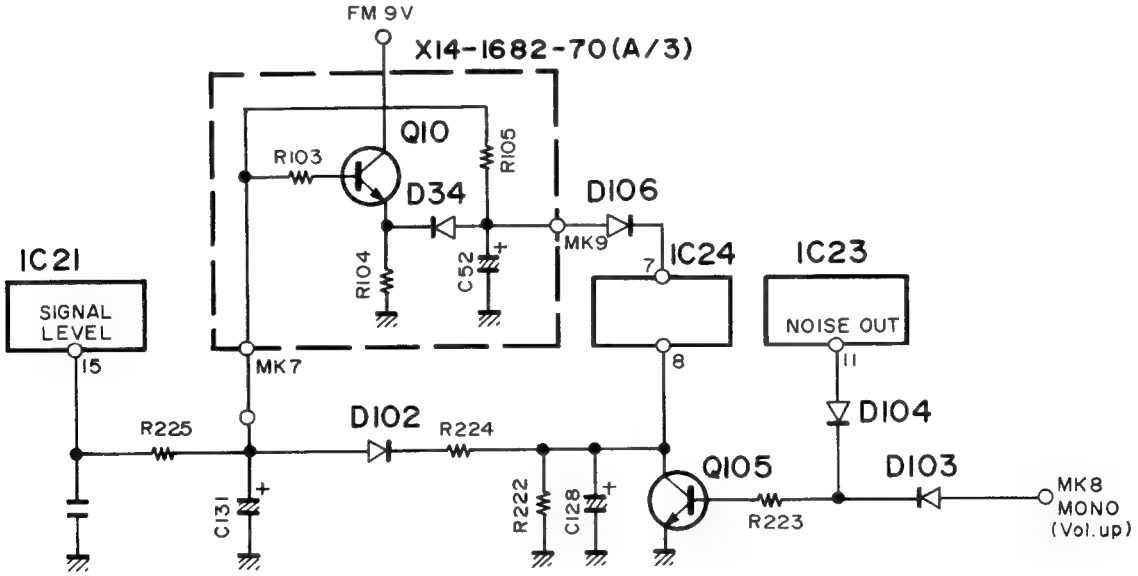
2. High-cut

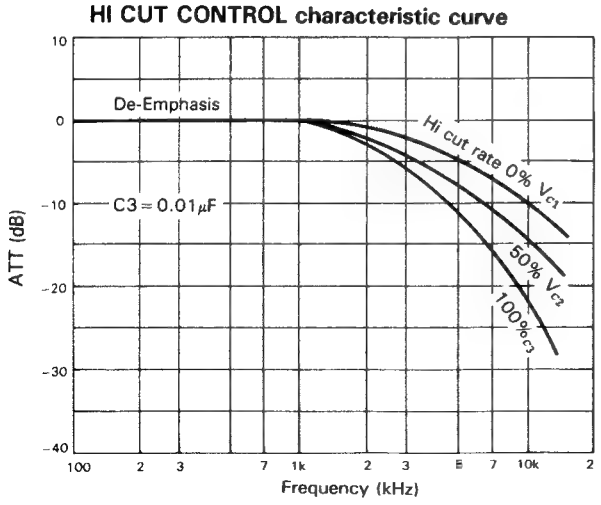
This circuit especially effective for poor receiving condition, improving the S/N ratio so that the high frequencies are cut off.

The signal generated at the S-meter out of IC21, pin 15 is allowed to pass through R225 and then, it is used to drive the emitter follower made by Q101 in X14-1682-70 (A/3) through the MK7 connector.

In normal receiving condition, C52 is charged through R105. However, when the S-meter lowers rapidly as the receiving condition becomes poor, C52 is discharged with a short time constant through D34.

C52 is designed to change fast in poor receiving condition with the time constant for high-cut, and change slowly in the normal receiving condition. (See Fig. 30.)





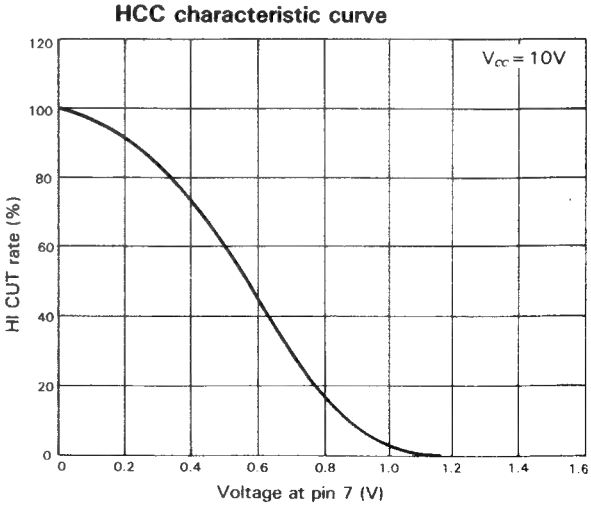
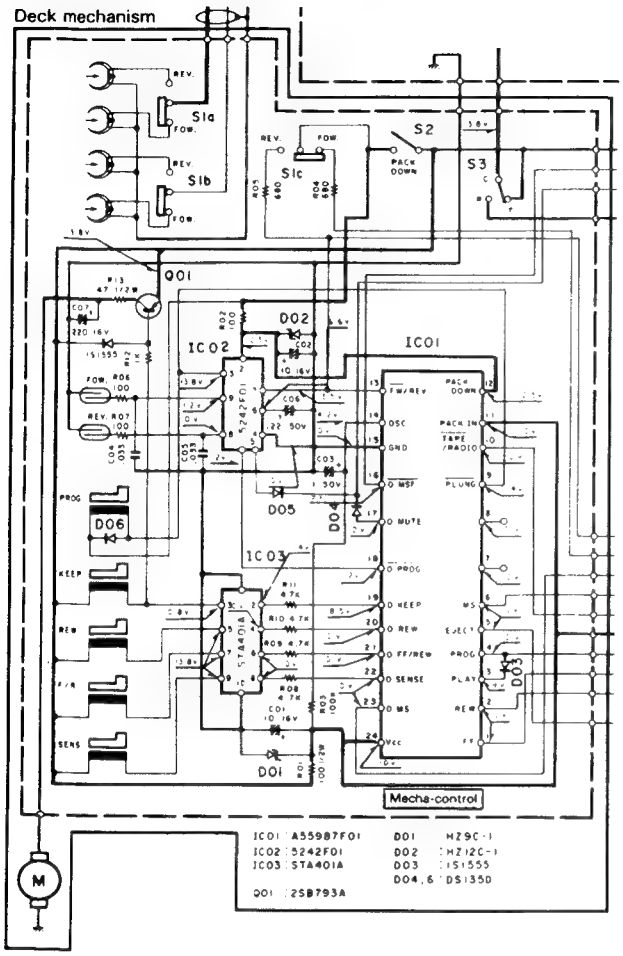
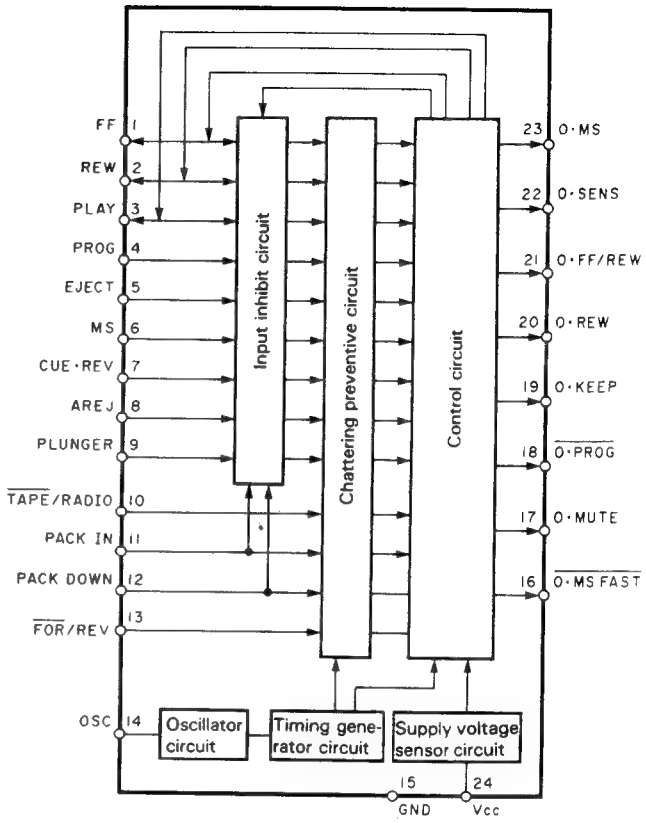


Fig. 30 ANRC Circuit

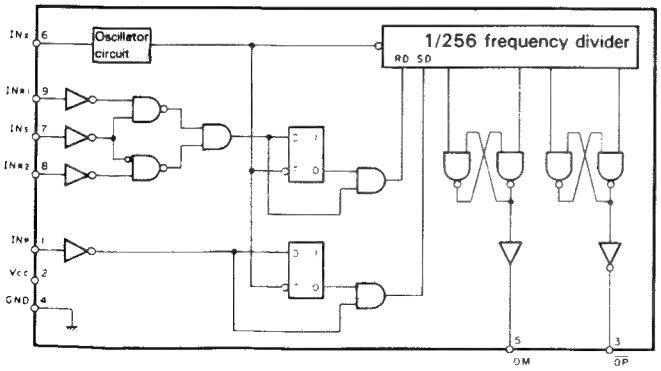
MECHANISM CONTROL DESCRIPTION

MECHA-CONTROL CIRCUIT

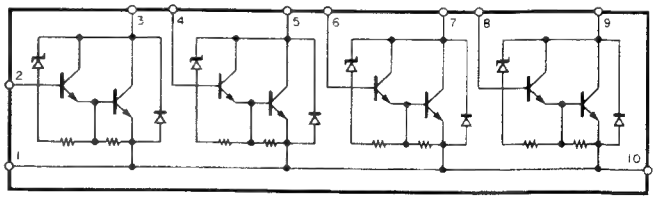




IC01 Mechanism control



IC02 Auto-reverse



IC03 Solenoid driver

MECHANISM CONTROL DESCRIPTION

IC01 allows the use of soft-touch type keys as the operational input keys, and in addition, it can control operations such as forced reversal of the play direction (PROG), tape cueing (tape advance and repeat), and switching of the radio and the tape (cassette standby). The output is sequence-controlled by the oscillation period decided in the stored oscillator circuit.

(1) Output States for Basic Operation Modes

	Input				Output								
Operation mode	T R	PACK IN	PACK DOWN	F R	FF	REW	PLAY	O-SENS	O-FF REW	O-REW	O-KEEP	O-PROG	O-MUTE
RADIO (C-STBY)	H	L	L	–	L	L	L	L	L	L	L	H	L
LOADING	L	H	L	–	L	L	L	L	L	L	H	H	H
EJECT	L	⌐[1]	⌐[1]	–	L	L	L	⌐⌐[2]	L	L	L	H	H
PLAY	L	H	H	–	L	L	H	⌐⌐[3]	L	L	H	H	⌐[4]
PROG	L	H	H	–	L	L	H	L	L	L	H	⌐[3]	L
Forward FF	L	H	H	L	H	L	L	⌐⌐[3]	⌐⌐[3]	L	H	H	H
Forward REW	L	H	H	L	L	H	L	⌐⌐[3]	⌐⌐[3]	⌐⌐[3]	H	H	H
Reverse FF	L	H	H	H	H	L	L	⌐⌐[3]	⌐⌐[3]	⌐⌐[3]	H	H	H
Reverse REW	L	H	H	H	L	H	L	⌐⌐[3]	⌐⌐[3]	L	H	H	H

Note 1) In EJECT operation, the PACK DOWN input changes "H→L" due to the O·KEEP output, and, later, the PACKIN input changes "H→L" due to the O·SENS output.

2) After EJECT operation is initiated, and delayed by $T_{D\text{-}E}$ a one shot multivibrator output is supplied.

3) A one shot multivibrator output is supplied simultaneously with the mode change.

4) It changes "H→L" at the termination of the one shot multivibrator output referred to in note 3).

(2) PROG Operation

If the PROG input is made "H" in PLAY mode, a one shot pulse ⌐⌐ is input at the $\overline{\text{O·PROG}}$ output, reversing the tape running direction.

In FF or REW mode, the PROG input is inhibited. Further, the PROG input is not input while it is held "H", because the rising edge of "L"→"H" is received as an input. In the KRC-929, the PLAY input/output and the PROG input are connected through a diode and used as a PLAY/PROG input. In FF or REW mode, if the PLAY/PROG input is made "H", it is input as a PLAY input (O. PROG output remains "H"). In PLAY mode, if the PLAY/PROG input is made "H", it is input as a PROG input.

(3) MS Operation (Tape Advance)

If the tape advance SW is depressed, the MS input is input. At each depression, the MS mode reverses. During MS·PLAY mode, the O·MS putput is "H" and light the tape advance LED. $\overline{\text{O·MS·F}}$ output is "H".

In MS·FAST mode (MS·FF or MS·REW), the O·MS output blinks and $\overline{\text{O·MS·F}}$ output becomes "L". Due to this "L" the tape advance IC operates.

(4) Plunger Input

It is necessary to add the drive signal for the PROG solenoid to $\overline{\text{PLUNGER}}$ input. This is for returning the internal state of the IC to PLAY mode when the tape end is reached during FF or REW.

(5) Input Inhibit

- In TUNER mode, PACK DOWN = "L"
  FF, REW and PLAY/PROG are ineffective.
- During cassette loading
  FF, REW, PLAY/PROG and EJECT are ineffective.
- Multiple depression
  When there are simultaneous inputs of FF, REW, PLAY AND EJECT.

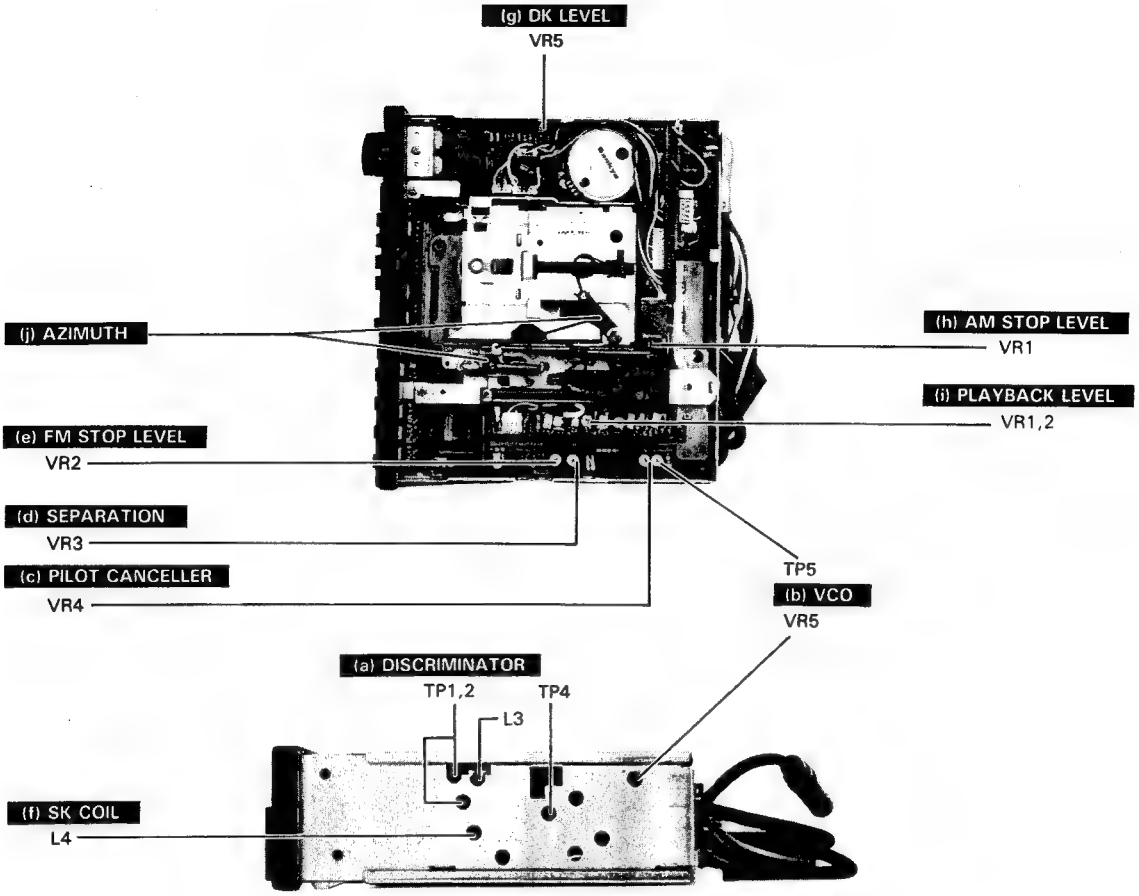
(6) Operation at Turning the Power on

When the power (Vcc) enters from 0 V, reset of all internal circuits is carried out. The reset signal is generated while Vcc is 1.0 - 1.5 V.

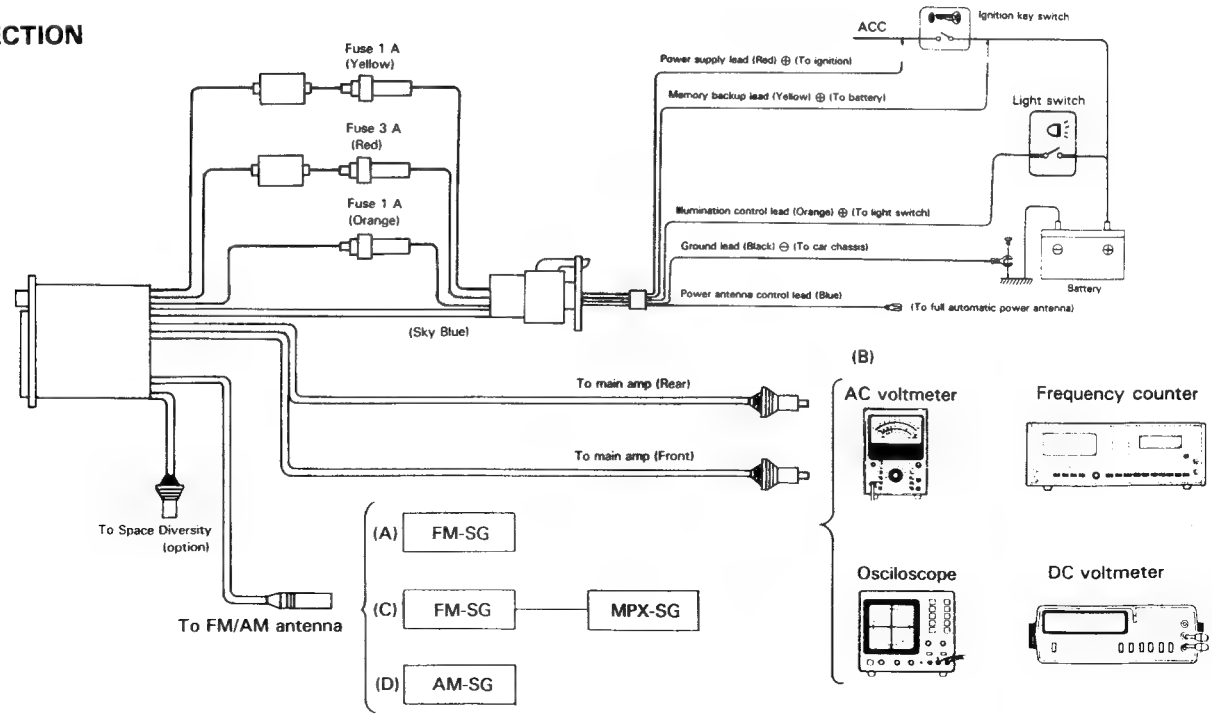
Input is inhibited after Vcc exceeds 3.2V for a period of 2 tosc, and the O·MUTE output is "H" for 4 tosc.

Q01 turns ON when the KEEP solenoid operates and supplies the power to the motor. The KEEP solenoid turns OFF during key-OFF (during PLAY, FF and REW), EJECT and C.STBY, and Q01 also turns OFF and the motor stops. Q01 is protected from the kickback of the KEEP solenoid by inserting a diode between the base and the emitter.

ADJUSTMENT/REGLAGES/ABGLEICH



CONNECTION



ADJUSTMENT

No.	ITEM	INPUT SETTINGS	OUTPUT SETTINGS	RECEIVER SETTINGS	ALIGNMENT POINTS	ALIGN FOR	FIG.
FM SECTION							
1	DISCRIMINATOR	(A) 98.1MHz 0dev 60dB(ANT input)	Connect a DC voltmeter between terminals TP1 and TP2.	FM 98.1MHz	L3	0V±20mV	(a)
2	MPX VCO	(A) 98.1MHz 0dev 60dB(ANT input)	Connect a frequency counter to TP5.	FM 98.1MHz	VR5	76.00kHz±100Hz	(b)
3	PILOT CANCELLER	(C) 98.1MHz 0dev Selector:L or R Pilot:±6kHz dev 60dB(ANT input)	(B)	FM 98.1MHz	VR4	Minimum output	(c)
4	SEPARATION	(C) 98.1MHz 1kHz,±40kHz dev Selector:L or R Pilot:±6kHz dev 60dB(ANT input)	(B)	FM 98.1MHz	VR3	Minimum crosstalk.	(d)
5	STOP LEVEL	(A) 98.1MHz 1kHz,±40kHz dev 20dB(ANT input)	(B)	FM SEEK	VR2	98.1MHz SEEK STOP	(e)
SDK SECTION		BK: ON					
①	SK COIL	(E) 98.1MHz 57kHz,5.33% mod DK,30% mod 60dB(ANT input)	Connect an AC voltmeter to TP4. (MK8)	FM 98.1MHz	L4	Maximum output	(f)
②	DK LEVEL	(E) 98.1MHz 1kHz,±40kHz dev 57kHz,5.33% mod DK,30% mod 60dB(ANT input)	(B)	FM 98.1MHz VOLUME:0	VR5 (X13)	6mV	(g)
AM SECTION							
(1)	STOP LEVEL	(D) 999kHz 400Hz,30% mod 35dB(ANT input)	(B)	MW SEEK	VR1 (X14)	999kHz SEEK STOP	(h)
CASSETTE DECK SECTION							
[1]	PLAYBACK LEVEL	PLAY test tape MTT-150	Connect an AC voltmeter to TP8(L) and TP7(R). (MK11)	TAPE PLAY	VR1 (L) VR2 (R)	580mV	(i)
[2]	AZIMUTH	PLAY test tape MTT-216 (10kHz)	(B)	TAPE PLAY	Head Azimuth Screw	Maximum output	(j)

REGLAGES

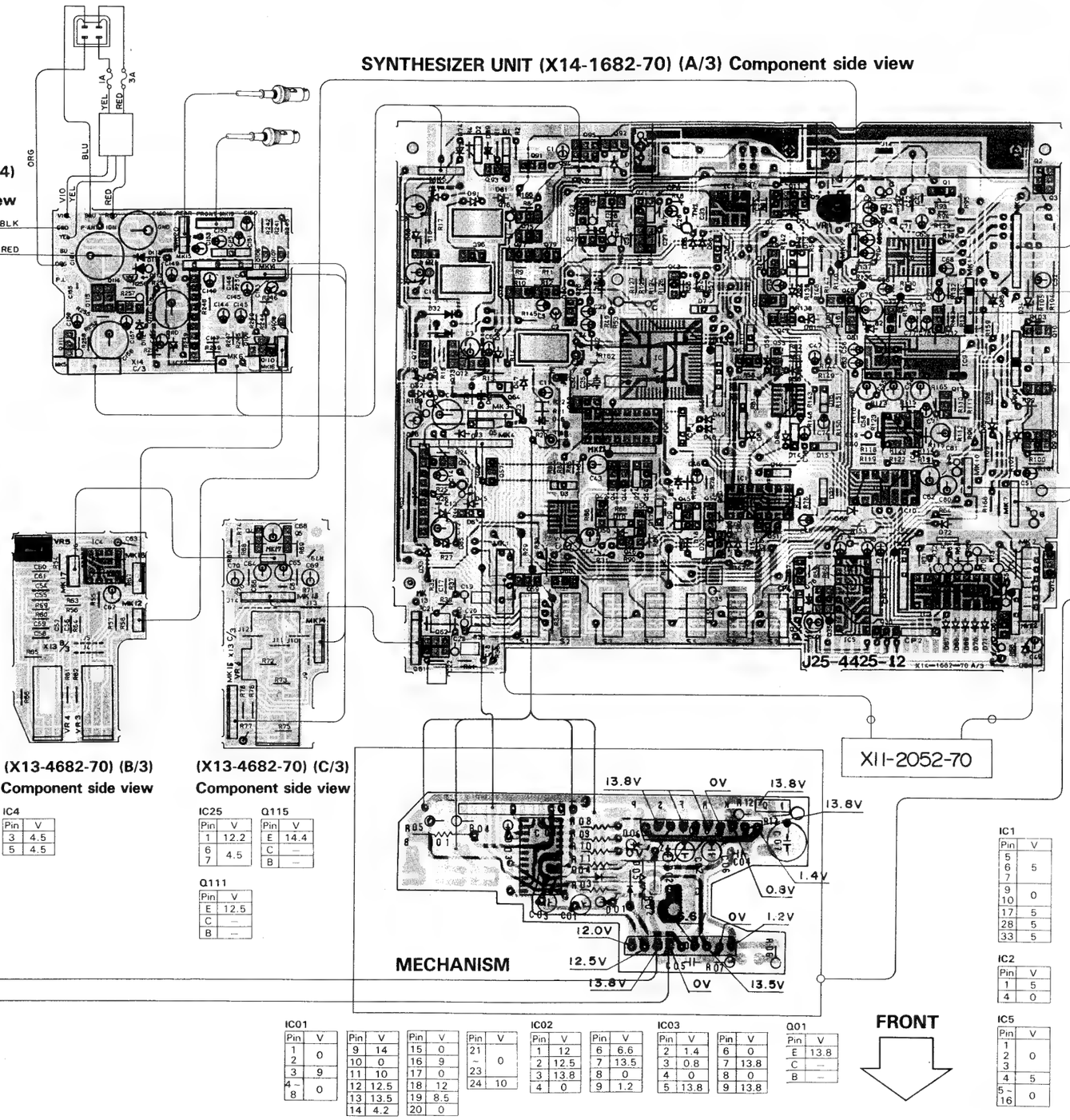
N°	ITEM	REGLAGE DE L'ENTREE	REGLAGE DE LA SORTIE	REGLAGE DU RECEIVER	POINTS DE L'ALIGNEMENT	ALIGNER POUR	FIG.
SECTION MF							
1	DISCRIMINATEUR	(A) 98,1MHz 0dév 60dB(Entrée ANT)	Connecter un voltmètre CC entre les TP1 et TP2.	FM 98,1MHz	L3	0V±20mV	(a)
2	OSCILLATEUR CONTROLE PAR LA TENSION	(A) 98,1MHz 0dév 60dB(Entrée ANT)	Connecter un compteur de fréquence à TP5.	FM 98,1MHz	VR5	76,00kHz±100Hz	(b)
3	SUPPRESSION DE SIGNAL PILOTE	(C) 98,1MHz 0dév Selecteur:G ou D Pilote:±6kHz dév 60dB(Entrée ANT)	(B)	FM 98,1MHz	VR4	Sortie minimale	(c)
4	SEPARATION	(C) 98,1MHz 1kHz.±40kHz dév Selecteur:G ou D Pilote:±6kHz dév 60dB(Entrée ANT)	(B)	FM 98,1MHz	VR3	Diaphonie minimale	(d)
5	NIVEAU D'ARRET	(A) 98,1MHz 1kHz.±40kHz dév 20dB(Entrée ANT)	(B)	FM SEEK Touche de command recherche.	VR2	98,1MHz ARRET	(e)
SECTION SDK	BK: ON						
①	SK COIL	(E) 98,1MHz 57kHz.5,33% mod DK.30% mod 60dB(Entrée ANT)	Connector un voltmètre CA à la TP4.(MK8)	FM 98,1MHz	L4	Sortie maximale	(f)
②	NIVEAU DE DK	(E) 98,1MHz 1kHz.±40kHz dév 57kHz.5,33% mod DK.30% mod 60dB(Entrée ANT)	(B)	FM 98,1MHz VOLUME:0	VR5 (X13)	6mV	(g)
SECTION MA							
(1)	NIVEAU D'ARRET	(A) 999kHz 400Hz. 30% mod 35dB(Entrée ANT)	(B)	MW SEEK Touche de commande recherche.	VR2 (X14)	999kHz ARRET	(h)
SECTION DU MAGNETPHONE							
[1]	NIVEAU DE LECTURE	Passer une bande d'essai MTT-150	Connecter un voltmètre CA les TP8(G) et TP7(D). (MK11)	Lecture de bande	VR1 (G) VR2 (D)	580mV	(i)
[2]	AZIMUTH	Passer une bande d'essai MTT-216 (10kHz)	(B)	Lecture de bande	Vis d'azimut	Sortie maximale	(j)

ABGLEICH

NR.	GEGENSTAND	EINGANGS-EINSTELLUNG	AUSGANGS-EINSTELLUNG	RECEIVER-EINSTELLUNG	ABGLEICH PUNKTE	ABGLEICHEN FÜR	ABB.
UKW-ABTEILUNG							
1	DISKRIMINATOR	(A) 98,1MHz 0 Hub 60dB(ANT-Eingang)	Einen Gleich-spannungsmesser zwischen Klemmen TP1 und TP2 anschließen.	FM 98,1MHz	L3	0V±20mV	(a)
2	SPANNUNGS-GEREGELTER OSZILLATOR	(A) 98,1MHz 0 Hub 60dB(ANT-Eingang)	Einen Frequenz messer zu TP5 anschließen.	FM 98,1MHz	VR5	76,00kHz±100Hz	(b)
3	PILOT-LÖSCHER	(C) 98,1MHz 0 Hub Pilot:6kHz Hub 60dB(ANT-Eingang)	(B)	FM 98,1MHz	VR4	Minimal Ausgang	(c)
4	STEREO KANAL TRENNUNG	(C) 98,1MHz 1kHz.±40kHz Hub Wähler:L oder R Pilot:±6kHz Hub 60dB(ANT-Eingang)	(B)	FM 98,1MHz	VR3	Minimales Übersprechen	(d)
5	SPERRSCHWELLE	(A) 98,1MHz 1kHz.±40kHz Hub 20dB(ANT-Eingang)	—	FM SEEK	VR2	98,1MHz STOP	(e)
SDK-ABTEILUNG	BK: ON						
①	SK COIL	(E) 98,1MHz 57kHz.5,33% mod DK.30% mod 60dB(ANT-Eingang)	Einen Wechsel-spannungsmesser zu TP4. (MK8)	FM 98,1MHz	L4	Maximaler Ausgang	(f)
②	DK PEGEL	(E) 98,1MHz 1kHz.±40kHz Hub 57kHz.5,33% mod DK.30% 60dB(ANT-Eingang)	(B)	FM 98,1MHz VOLUME:0	VR5 (X13)	6mV	(g)
MW-ABTEILUNG							
(1)	SPERRSCHWELLE	(D) 98,1MHz 400Hz.30% mod 35dB(ANT-Eingang)	(B)	MW SEEK	VR1 (X14)	999kHz STOP	(h)
CASSETTEN-DECK-ABTEILUNG							
[1]	WIDERGABE PEGEL	Ein MTT-150 Testband abspielen	Einen Wechsel-spannungsmesser zu TP8(L) und TP7(R) anschließen. (MK11)	Bandwiedergabe	VR1 (L) VR2 (R)	580mV	(i)
[2]	AZIMUTH	Ein MTT-216 (10kHz) Testband abspielen	(B)	Bandwiedergabe	Kopfazimutschraube	Maximaler Ausgang	(j)

PC BOARD

SYNTHESIZER UNIT (X14-1682-70) (A/3) Component side view



(X14-1682-70) (C/4) Component side view

(X13-4682-70) (B/3) Component side view

(X13-4682-70) (C/3) Component side view

SUB-CIRCUIT UNIT (X13-4682-70) (A/3) Component side view

(X14-1682-70) (B/3) Component side view

IC4

Pin	V
3	4.5
5	4.5

IC25

Pin	V
1	12.2
6 7	4.5

Q115

Pin	V
E	14.4
C	—
B	—

Q111

Pin	V
E	12.5
C	—
B	—

IC01

Pin	V
1 2	0
3	9
4 ~ 8	0

Pin	V
9	14
10	0
11	10
12	12.5
13	13.5
14	4.2

Pin	V
15	0
16	9
17	0
18	12
19	8.5
20	0

Pin	V
21 ~ 23	0
24	10

IC02

Pin	V
1	12
2	12.5
3	13.8
4	0

Pin	V
6	6.6
7	13.5
8	0
9	1.2

IC03

Pin	V
2	1.4
3	0.8
4	0
5	13.8

Pin	V
6	0
7	13.8
8	0
9	13.8

Q01

Pin	V
E	13.8
C	—
B	—

IC1

Pin	V
5 6 7	5
9 10	0
17	5
28	5
33	5

IC2

Pin	V
1	5
4	0

IC5

Pin	V
1 2 3	0
4	5
5 ~ 16	0

IC2,3

Pin	V
1 2	4.5
3	0
4	4.4
5	4.5
6	4.6

Pin	V
7	4.8
8	4.5
9	4.6
10	0
11 12	1.0

Pin	V
13	0
14	3.6
15	4.9
16	4.3
18	4.5
19	4.6

Pin	V
20 21	1.0
22 ~ 25	4.9

IC21

Pin	V
2	2.6
3	2.6
5	1.9
6	0
7 ~ 13	5.0

IC22

Pin	V
1	0
2	9.6
3 4	2.0
7	BK Band 9.3 SK
8	9.5
9	7.5
10	7.9
11	1.6
12	9.6
13	2.9
14	9.6

IC23

Pin	V
1	4.3
2	3.1
3	0
4	4.9
5	0
6	4.7
7	3.5
8	9.6
9	0
10	4.6
11	0
12	4.3

IC24

Pin	V
1	9.6
2	3.2
3	3.4
4	2.7
5 6	4.4
9	0

Pin	V
10	14.2
11 12	2.7
13	0.5
14 15	2.7
16	2.5

Q103

Pin	V
E	0
C	—
B	FM Band 4.5 AM Band 0

IC6

Pin	V
1	2.4
2	0
3	3
4 ~ 7	2.5
8	5.0
9	2.5
10 11 12	0
13	2.5
14	5.0
15 ~ 18	2.5
19	0

IC7

Pin	V
1	6
2 3	0.1
4 5	0
6	6
7	0.1
8	0
9	6.2

IC8

Pin	V
1 2 3	4.5
4	0
5 6 7	4.5
8	9.0

IC9

Pin	V
1	6
3 4	4.0
5	8.0
6	4.0

IC10

Pin	V
1	5
2	0
5	0
6	5
7	0
8	5
9	0
12	0
13 14	5

IC11

Pin	V
7	0
12	0
14	5

IC12

Pin	V
7	0
14	5

IC13

Pin	V
1	0
7	0
14	5

Q2

Pin	V
E	AM: 9.9.0
C	—
B	—

Q3,4,5,8,9,11,21,23,24,26,27,41,43,46,59,64,72,78,80,94,96

Pin	V
E	0
C	—
B	—

Q7

Pin	V
E	0
C	—
B	FM: 5

Q10

Pin	V
E	—
C	FM: 9
B	—

Q13

Pin	V
E	—
C	6
B	—

Q31

Pin	V
E	6.2
C	—
B	—

Q35

Pin	V
E	—
C	0
B	—

Q37,57

Pin	V
E	0
C	0
B	—

Q42

Pin	V
E	4.5
C	—
B	—

Q56

Pin	V
E	—
C	—
B	0

Q58

Pin	V
E	5
C	0
B	—

Q63

Pin	V
E	0
C	0
B	5

Q71

Pin	V
E	5
C	—
B	5.9

Q73

Pin	V
E	0
C	5
B	

Q75

Pin	V
E	13.6
C	AM: 9.9.2
B	—

Q76

Pin	V
E	AM: 9.9.2
C	—
B	10

Q77

Pin	V
E	AM: 9.9.2
C	—
B	—

Q79

Pin	V
E	AM: 9.9.2
C	FM: 9.9.2
B	

Q81

Pin	V
E	9.4
C	—
B	10

Q82

Pin	V
E	6.0
C	—
B	6.5

Q92

Pin	V
E	REF 9.9.6
C	—
B	—

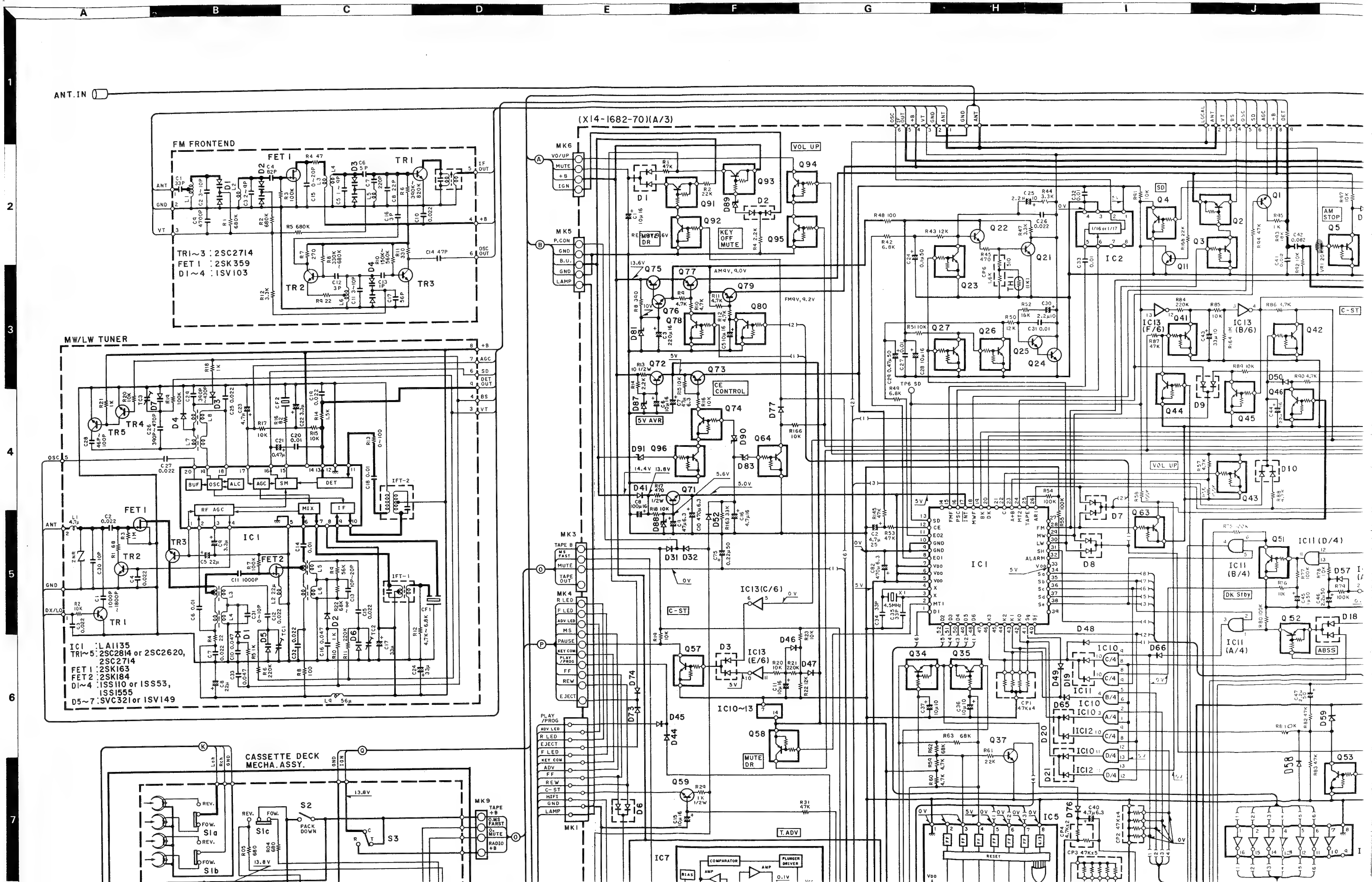
Q93

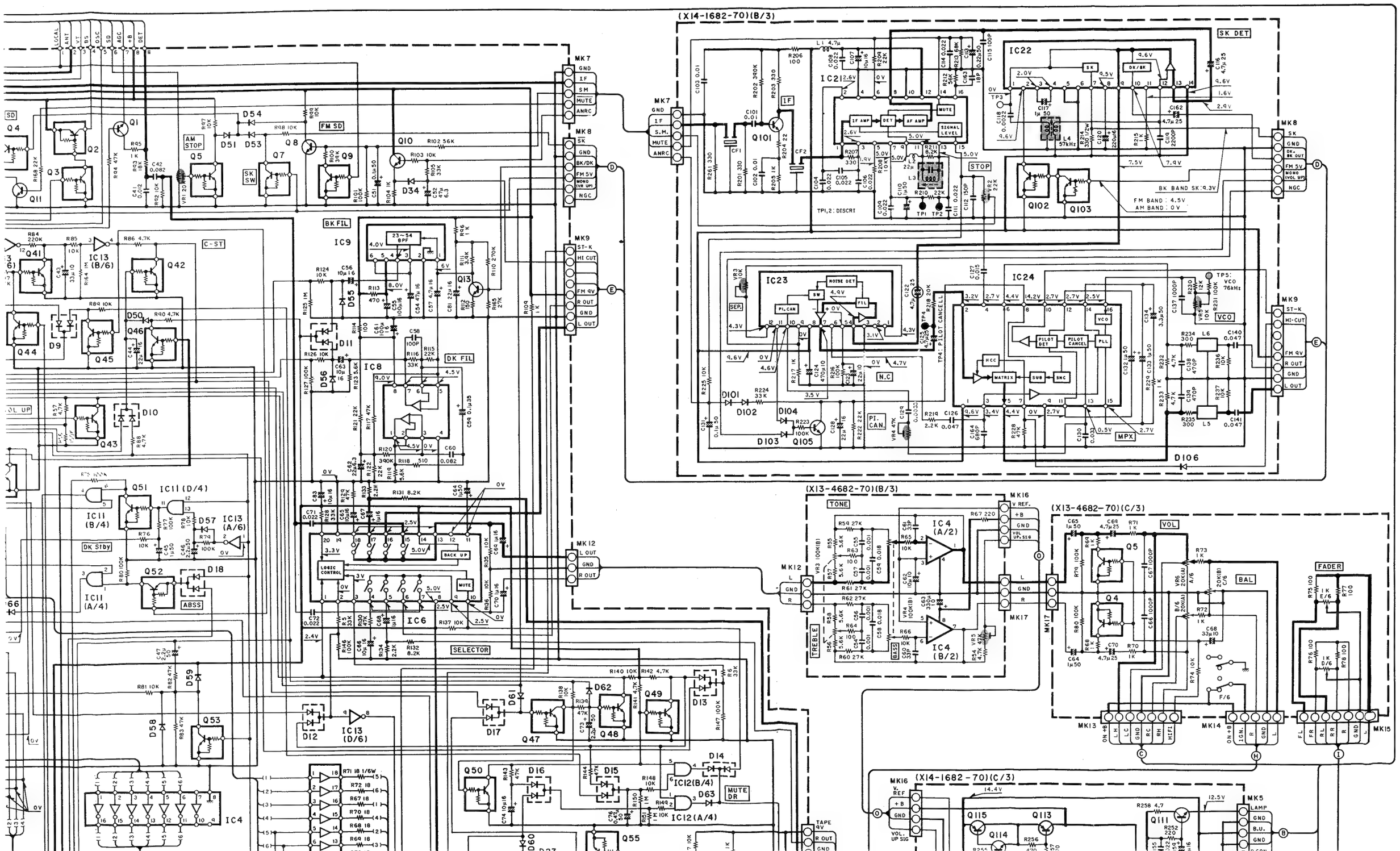
Pin	V
E	13.6
C	—
B	—

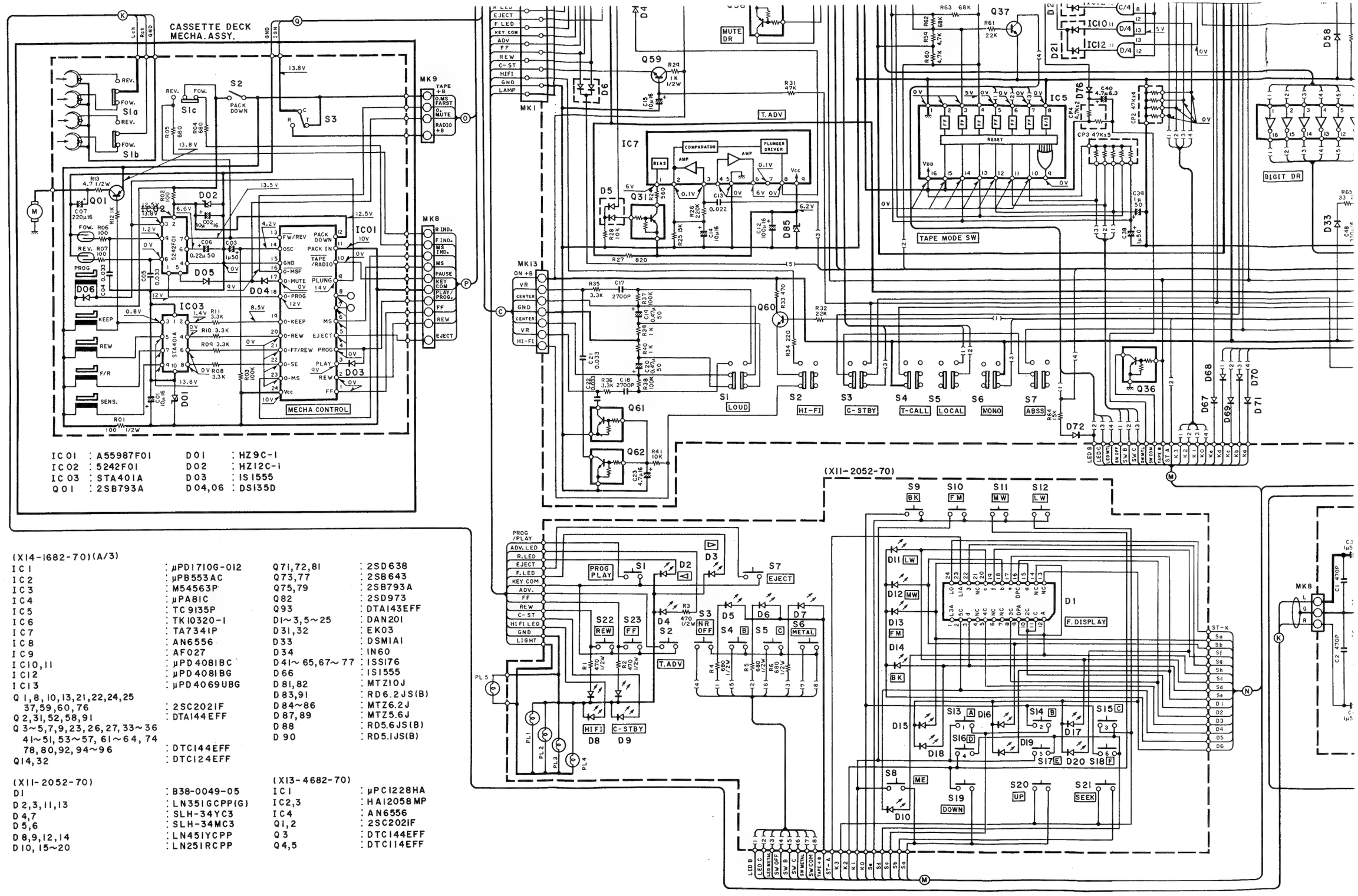
Q95

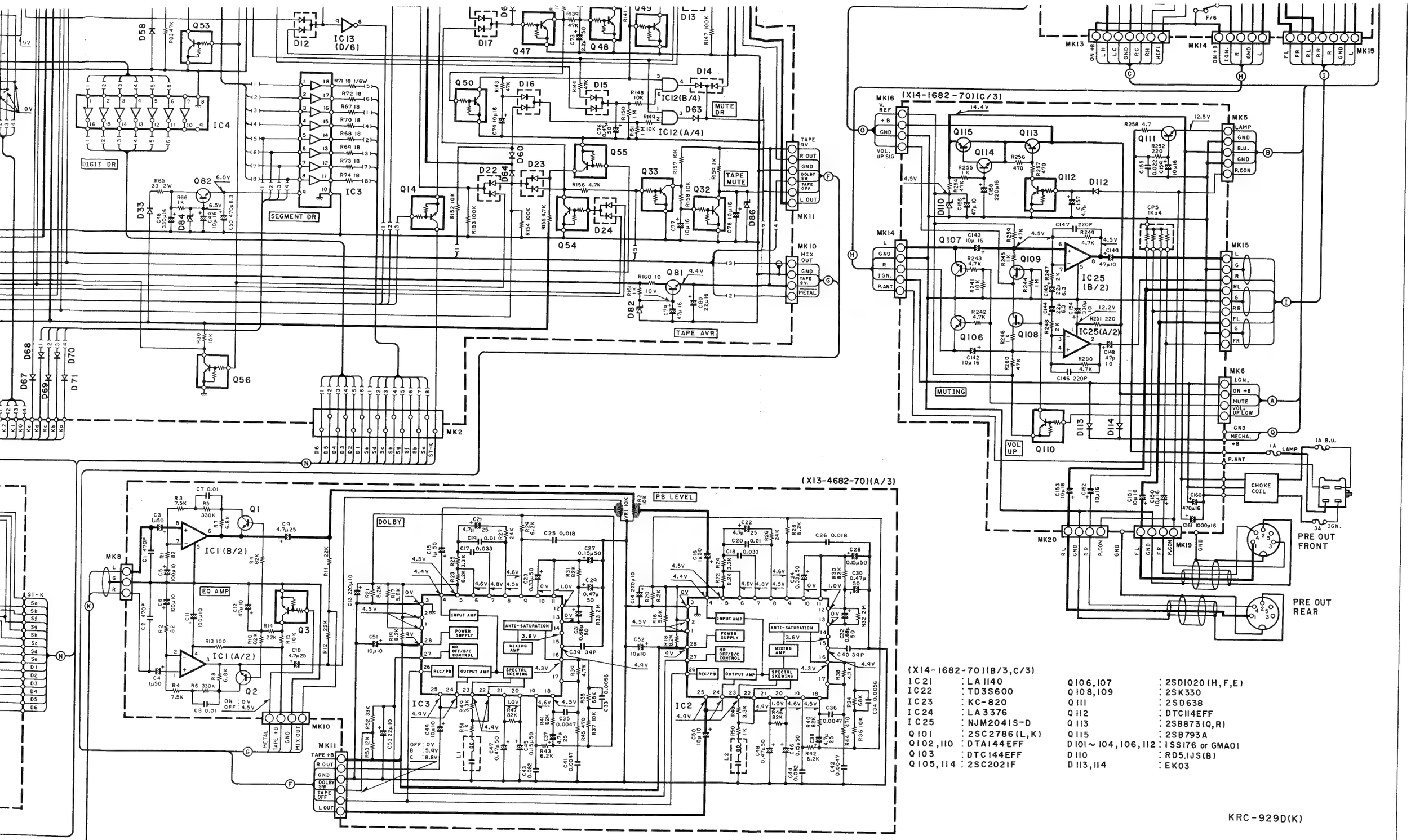
Pin	V
E	—
C	—
B	2.4

Refer to the schematic diagram for the values of resistors and capacitors.
The PC board drawing is viewing from the side easy to check.


ANT.IN
FM FRONTEND
TR1~3 :2SC2714
FET1 :2SK359
D1~4 :1SV103
MW/LW TUNER
IC1 :LA1135
TR1~5:2SC2814 or 2SC2620, 2SC2714
FET1 :2SK163
FET2 :2SK184
D1~4 :1SS110 or 1SS53, 1SS155
D5~7 :SVC321 or 1SV149
CASSETTE DECK MECHA. ASSY.
(X14-1682-70)(A/3)
VOL UP
KEY OFF MUTE
5V AVR
CE CONTROL
C-ST
MUTE DR
T. ADV
AM STOP
DK Stby
ABSS
IC1
IC2
IC5
IC7
COMPARATOR
PLUNGER DRIVER
MK1
MK3
MK4
MK5
MK6
MK9


(X14-1682-70)(B/3)
(X13-4682-70)(B/3)
(X13-4682-70)(C/3)
(X14-1682-70)(C/3)
MK7
MK8
MK9
MK12
MK16
MK17
MK13
MK14
MK15
MK5
IC1
IC2
IC4
IC6
IC8
IC9
IC11 (B/4)
IC11 (D/4)
IC12(B/4)
IC12(A/4)
IC13 (A/6)
IC13 (B/6)
IC13 (D/6)
IC22
IC23
IC24
Q101
Q102
Q103
Q105
Q115
Q113
Q114
SK DET
IF
MUTE
STOP
SEP.
PI.CAN
PILOT DET
PILOT CANCEL
PLL
VCO
MATRIX
SUB
SNC
MPX
TONE
VOL
BAL
FADER
TREBLE
BASS
SELECTOR
LOGIC CONTROL
BACK UP
MUTE
BK FIL
DK FIL
C-ST
DK Stby
ABSS
AM STOP
FM SD
SK SW
TP1,2: DISCRI
TP4: PILOT CANCELL
TP5: VCO 76kHz
BK BAND SK:9.3V
FM BAND : 4.5V
AM BAND : 0V


CASSETTE DECK
MECHA. ASSY.
MECHA CONTROL
MK1
MK8
MK9
MK13
IC01 : A55987F01
IC02 : 5242F01
IC03 : STA401A
Q01 : 2SB793A
D01 : HZ9C-1
D02 : HZ12C-1
D03 : IS1555
D04,06 : DSI35D
(X14-1682-70)(A/3)
IC1 : μPD1710G-012
IC2 : μPB553AC
IC3 : M54563P
IC4 : μPA81C
IC5 : TC9135P
IC6 : TK10320-1
IC7 : TA7341P
IC8 : AN6556
IC9 : AF027
IC10,11 : μPD4081BC
IC12 : μPD4081BG
IC13 : μPD4069UBG
Q1,8,10,13,21,22,24,25 37,59,60,76 : 2SC2021F
Q2,31,52,58,91 : DTA144EFF
Q3~5,7,9,23,26,27,33~36 41~51,53~57,61~64,74 78,80,92,94~96 : DTC144EFF
Q14,32 : DTC124EFF
(X11-2052-70)
D1 : B38-0049-05
D2,3,11,13 : LN351GCPP(G)
D4,7 : SLH-34YC3
D5,6 : SLH-34MC3
D8,9,12,14 : LN451YCPP
D10,15~20 : LN251RCPP
Q71,72,81 : 2SD638
Q73,77 : 2SB643
Q75,79 : 2SB793A
Q82 : 2SD973
Q93 : DTA143EFF
D1~3,5~25 : DAN201
D31,32 : EK03
D33 : DSM1A1
D34 : IN60
D41~65,67~77 : ISS176
D66 : IS1555
D81,82 : MTZ10J
D83,91 : RD6.2JS(B)
D84~86 : MTZ6.2J
D87,89 : MTZ5.6J
D88 : RD5.6JS(B)
D90 : RD5.1JS(B)
(X13-4682-70)
IC1 : μPC1228HA
IC2,3 : HA12058MP
IC4 : AN6556
Q1,2 : 2SC2021F
Q3 : DTC144EFF
Q4,5 : DTC114EFF
(XII-2052-70)
IC10
IC11
IC12
D1 F. DISPLAY
D11 LW
D12 MW
D13 FM
D14 BK
D15
D16
D17
D18
D19
D20
D21
D58
D67
D68
D69
D70
D71
D72
Q36
Q37
Q59
Q60
Q61
Q62
IC5
IC7
S1 LOUD
S2 HI-FI
S3
S4 T-CALL
S5 LOCAL
S6 MONO
S7 ABSS
S8 ME
S9 BK
S10 FM
S11 MW
S12 LW
S13 A
S14 B
S15 C
S16 D
S17 E
S18 F
S19 DOWN
S20 UP
S21 SEEK
S22 REW
S23 FF
TAPE MODE SW
DIGIT DR
T. ADV
MUTE DR
PROG /PLAY
EJECT
HIFI
C-STBY
D8
D9
PL1
PL2
PL3
PL4
PL5
(XII-2052-70)

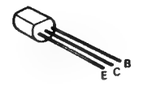


(X14-1682-70)(B/3,C/3)

IC21	: LA1140	Q106,107	: 2SD1020(H,F,E)
IC22	: TD3S600	Q108,109	: 2SK330
IC23	: KC-820	Q111	: 2SD638
IC24	: LA3376	Q112	: DTC114EFF
IC25	: NJM2041S-D	Q113	: 2SB873(Q,R)
Q101	: 2SC2786(L,K)	Q115	: 2SB793A
Q102,110	: DTA144EFF	D101~104,106,112	: 1SS176 or GMA01
Q103	: DTC144EFF	D110	: RD5.1JS(B)
Q105,114	: 2SC2021F	D113,114	: EK03

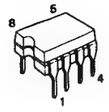
KRC-929D(K)

2SA1020
2SB873

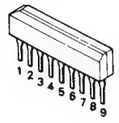


2SC262D
2SC2714
2SC2814

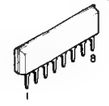
μPB553AC



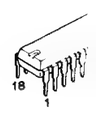
NJM2041S-D
TA7341P



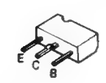
μPC1228HA



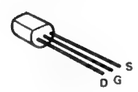
M54563P



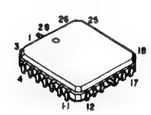
DTA143FF 2SB643
DTA144FF 2SB793A
DTC114FF 2SB793A
DTC124FF 2SC2021F
DTC144FF 2SD638
2SD973



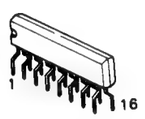
2SK163



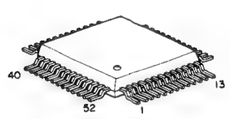
HA12058MP



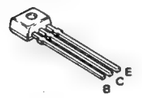
LA1140
LA3376



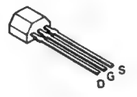
μPD1710G-012



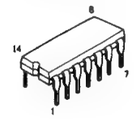
2SC2786
2SD1020



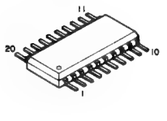
2SK330



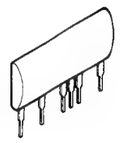
μPD4069UBG
μPD4081BC



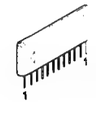
TK10320



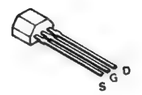
AF027



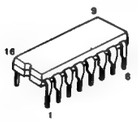
KC-820



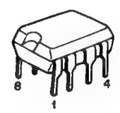
2SK184



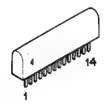
TC9135P
μPA81C



AN6556



TD3S600



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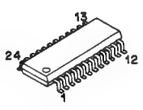
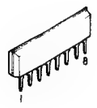


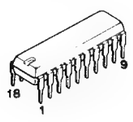
STEREO CASSETTE TUNER

KRC-929D

μPC1228HA



M54563P



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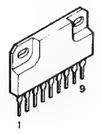
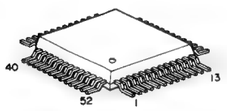
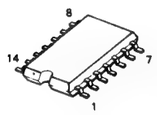


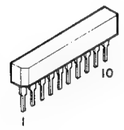
μPD1710G-012



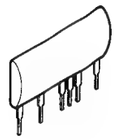
TC4081BF
μPD4081BG



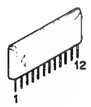
STA401A



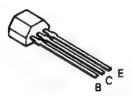
AF027



KC-820



2SC2669



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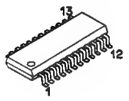


DC voltages are as measured with a high impedance voltmeter. Values may vary slightly due to variations between individual instruments or/and units.

Les tensions c.c. doivent être mesurées avec un voltmètre à haute impédance. Les valeurs peuvent différer légèrement du fait des variations inhérentes aux appareils et aux instruments de mesure individuels.

Die angegebenen Gleichspannungswerte wurden mit einem hochohmigen Spannungsmesser gemessen. Dabei schwanken die Meßwerte aufgrund von Unterschieden zwischen einzelnen Instrumenten oder Geräten u.U. geringfügig.

CAUTION: For continued safety, replace safety critical components only with manufacturer's recommended parts (refer to parts list). ⚠ Indicates safety critical components. To reduce the risk of electric shock, leakage-current or resistance measurements shall be carried out (exposed parts are acceptably insulated from the supply circuit) before the appliance is returned to the customer.

SPECIFICATIONS

Specification subject to change without notice. (*...EIA Standard)

FM Tuner Section

Frequency range	87.5 ~ 108.0 MHz
* Usable sensitivity (DIN)	1.0 μV/75 Ω
Stereo sensitivity (S/N = 46 dB)	2.6 μV/75 Ω
* Frequency response (±4.5 dB)	40 ~ 15,000 Hz
Signal to noise ratio (IEC-A)	70 dB
* Selectivity (DIN)	65 dB
* Stereo separation (1 kHz)	40 dB
19 kHz carrier leakage	−51 dB (40k Dev. 1 kHz)

AM Tuner Section

MW frequency range	531 ~ 1,602 kHz
MW usable sensitivity	30 μV
LW frequency range	153 ~ 281 kHz
LW usable sensitivity	50 μV

Cassette Deck Section

Tape speed	4.76 cm/s
* Wow & flutter (WRMS)	0.08% (WRMS)
* Wow & flutter (DIN)	0.12% (W-PEAK)
Fast winding time (C-60)	80 s (C-60)
* Frequency response (+4, −6 dB)	30 ~ 18,000 Hz
* Stereo separation (1 kHz)	37 dB
* Signal to noise ratio (IEC-A)	
Dolby NR ON (CCIR/ARM)	DOLBY-B 67 dB, DOLBY-C 75 dB
Dolby NR OFF (CCIR/ARM)	58 dB

Audio Section

* Tone action bass (100 Hz)	±10 dB
* Tone action treble (10 kHz)	±10 dB
* Pre. output level/impedance	300 mV/100Ω

General

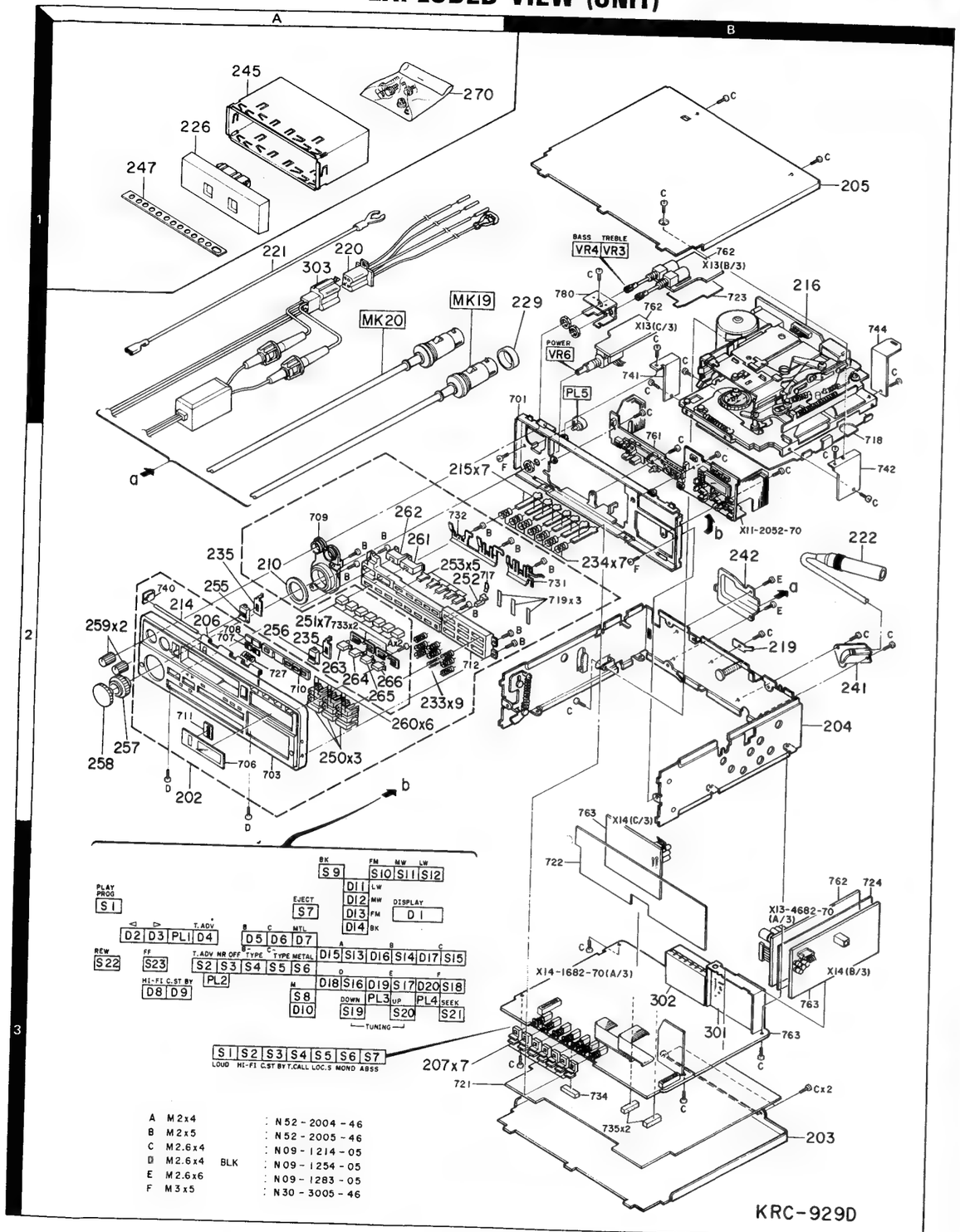
Operating voltage	14.4 (11 ~ 16) V
Current consumption	0.75 A
Dimensions (W × H × D)	180 × 58 × 165 mm
Body size (W × H × D)	180 × 52 × 155 mm
Weight	1.9 kg (Lbs)

Kenwood follows a policy of continuous advancements in development. For this reason specifications may be changed without notice.

Kenwood poursuit une politique de progrès constants en ce qui doncerne le développement. Pour cette raison, les spécifications sont sujettes à modifications sans préavis.

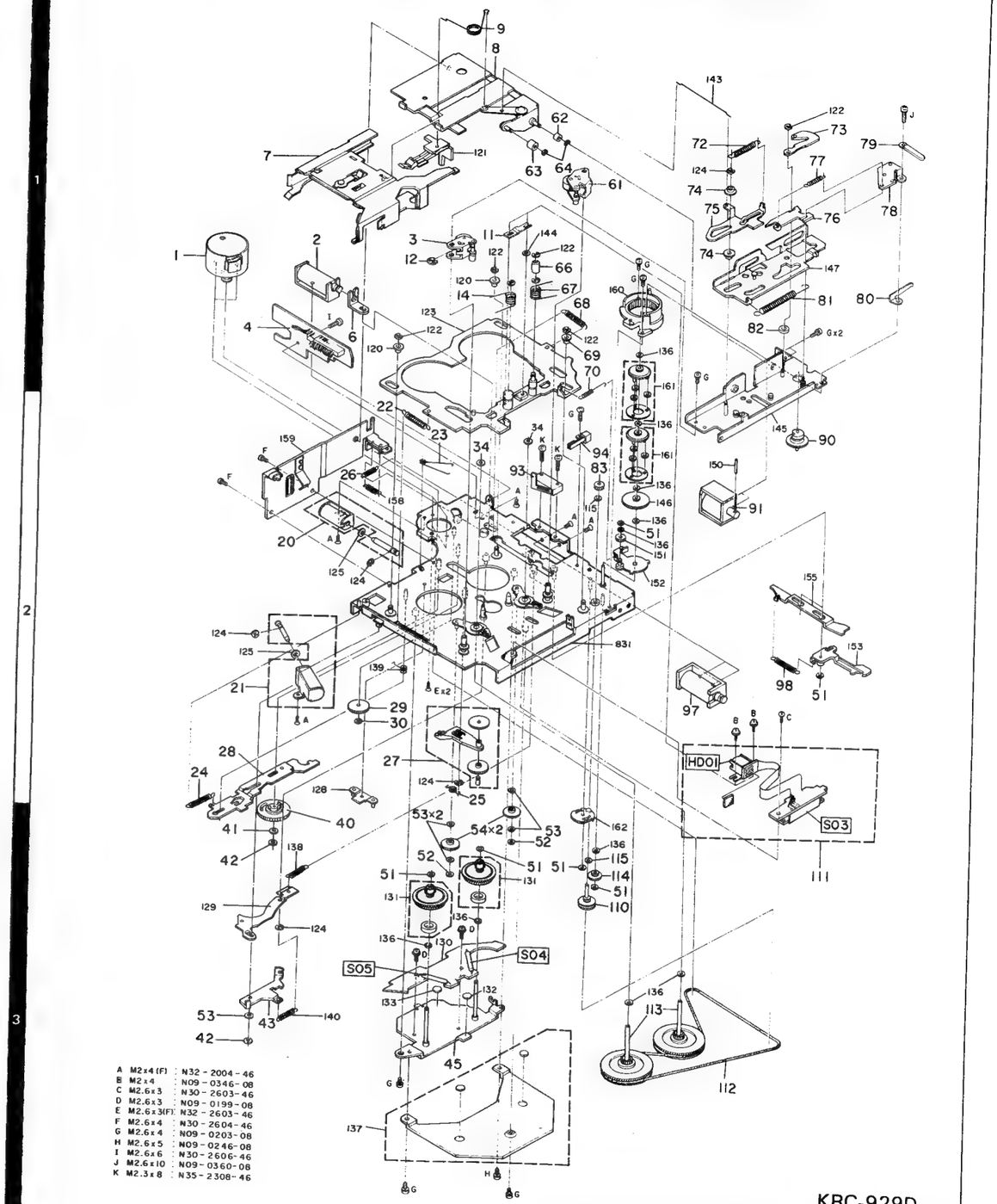
Kenwood strebt ständige, Verbesserungen in der Entwicklung an. Daher bleiben Änderungen der technischen Daten jederzeit vorbehalten.

EXPLODED VIEW (UNIT)

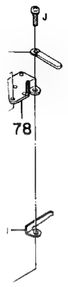


Parts with the exploded numbers larger than 700 are not supplied.

EXPLODED VIEW (MECHANISM)



Parts with the exploded numbers larger than 700 are not supplied.



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PARTS LIST

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KRC-929D						
202			A20-4755-02	PANEL ASSY		
202	2A	*	A20-4036-02	PANEL ASSY		
203	3B	*	A40-0329-12	BOTTOM PLATE		
204	2B	*	A50-0118-12	SIDE PLATE ASSY		
205	1B	*	A52-0068-12	TOP COVER		
206	2A		A53-0611-03	CASSETTE LID ASSY		
207	3A		B09-0036-04	CAP (EXTENSION FOR SW1-7)		
210	2A	*	B20-0566-04	VOLUME SCALE(RING)		
-			B46-0100-00	WARRANTY CARD		
-		*	B50-5294-00	INSTRUCTION MANUAL(ENG,FR)		
-		*	B50-5295-00	INSTRUCTION MANUAL(GER,SP)		
-			B58-0245-23	CAUTION CARD		
-		*	B58-0313-04	CAUTION CARD		
214	2A		D21-0512-04	SHAFT (CASSETTE LID ASSY)		
215	2A	*	D22-0051-04	SHAFT COUPLING (S1-7)		
216	1B		D40-0280-05	CASSETTE MECHANISM ASSY		
219	2B	*	E21-0017-04	PUSH TERMINAL (REAR)		
220	1A		E30-0835-15	DC CORD		
221	1A		E30-0843-05	GROUND WIRE		
222	2B	*	E30-0867-15	CORD WITH PLUG (ANT)		
223	2B	*	E30-0868-15	CORD WITH DIN CONNECTOR(DIN)		
226	1A	*	F07-0445-11	COVER (SECURITY)		
229	1B		F29-0046-05	INSULATING COVER (MK19)		
233	2A		G01-1408-14	COMPRESSION SPRING(A-F,TUN,SEK		
234	2B	*	G01-1409-04	COMPRESSION SPRING(S1-7)		
235	2A	*	G02-0125-14	FLAT SPRING (PROG,EJECT)		
-		*	H01-5208-04	ITEM CARTON CASE		
-		*	H03-0687-04	OUTER CARTON CASE		
-		*	H10-1705-03	POLYSTYRENE FOAMED FIXTURE		
-			H12-0125-04	CARTON BOARD		
-			H25-0085-04	PROTECTION BAG		
-			H25-0112-04	PROTECTION BAG(INSTRUCTION)		
-			H25-0188-04	PROTECTION BAG		
241	2B	*	J19-0819-04	LEAD HOLDER (ANT CORD)		
242	2B	*	J19-0840-04	LEAD HOLDER (DC CORD)		
245	1A	*	J21-3367-02	MOUNTING HARDWARE(INSTALLATION		
247	1A		J54-0059-04	STAY (INSTALLATION)		
-			J61-0054-05	WIRE BAND		
250	2A		K27-1120-14	KNOB(BUTTON)DOWN,UP,SEEK		
251	2A	*	K27-1121-14	KNOB(BUTTON)MECHANISM SW		
252	2A		K27-1122-24	KNOB(BUTTON)MEMORY		
253	2A		K27-1123-14	KNOB(BUTTON)T.ADV,MTL,DOLBY		
255	2A	*	K27-1126-14	KNOB(BUTTON)PROG		
256	2A	*	K27-1276-04	KNOB(BUTTON)EJECT		
257	2A		K29-0439-04	KNOB FADER		
258	2A		K29-0440-03	KNOB VOLUME		
259	2A		K29-0441-14	KNOB BASS,TREBLE		
260	2A		K29-1481-04	KNOB ASSY A,B,C,D,E,F		
261	2A		K29-1482-04	KNOB ASSY FF		
262	2A		K29-1483-04	KNOB ASSY REW		
263	2A	*	K29-1831-04	KNOB BK		
264	2A	*	K29-1832-04	KNOB FM		

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265	2A	*	K29-1833-04	KNOB MW		
266	2A	*	K29-1834-04	KNOB LW		
270	1A	*	N99-0071-05	SCREW SET		
CONTROL (X11-2052-70)						
D1	3A		B38-0049-05	LED DISPLAY ASSY		
D2 ,3	3A		B30-0480-05	LED(LN351GCPP)GRN(REW,FF)		
D4	3A		B30-0799-05	LED(SLH-34YC3)YEL(T.ADV)		
D5 ,6	3A		B30-0800-05	LED(SLH-34MC3)GRN(DOLBY B,C)		
D7	3A		B30-0799-05	LED(SLH-34YC3)YEL(METAL)		
D8 ,9	3A		B30-0481-05	LED(LN451YCPP)AMB(HIFI,C.ST-BY		
D10	3A		B30-0479-05	LED(LN251RCPP)RED(MEMORY)		
D11	3A		B30-0480-05	LED(LN351GCPP)GRN(LW)		
D12	3A		B30-0481-05	LED(LN451YCPP)AMB(MW)		
D13	3A		B30-0480-05	LED(LN351GCPP)GRN(FM)		
D14	3A		B30-0481-05	LED(LN451YCPP)AMB(BK)		
D15 -20	3A		B30-0479-05	LED(LN251RCPP)RED(A,B,C,D,E,F)		
PL1	3A		B30-0435-05	LAMP(0.04A,16V)		
PL2 -4	3A		B30-1006-05	LAMP(0.026A,18V)		
PL5	1B		B30-1001-05	LAMP(0.04A,16V)		
R4 -6			RD14DB2H681J	SMALL-RD 680 J 1/2W		
S1 -21	3A		S40-1079-05	PUSH SWITCH		
S22 ,23	3A		S40-1080-05	PUSH SWITCH(WITH LED)REW,FF		
SUB-CIRCUIT (X13-4682-70)						
C1 ,2			CK45B1H471K	CERAMIC 470PF K		
C3 ,4			CS15E1C010M	TANTAL 1UF 16WV		
C5 ,6			C90-1236-05	ELECTRO 2200UF 25WV		
C7 ,8			CQ92M1H103J	MYLAR 0.010UF J		
C9 ,10			C90-0482-05	ELECTRO 4.7UF 25WV		
C11			C90-1236-05	ELECTRO 2200UF 25WV		
C12			CE04W1A470M	ELECTRO 47UF 10WV		
C13 ,14			CE04W1A221M	ELECTRO 220UF 10WV		
C15 ,16			C90-0824-05	ELECTRO 1UF 50WV		
C17 ,18			CQ92M1H333J	MYLAR 0.033UF J		
C19 ,20			CQ92M1H103J	MYLAR 0.010UF J		
C21 ,22			C90-0482-05	ELECTRO 4.7UF 25WV		
C23 ,24			C90-0507-05	ELECTRO 0.33UF 50WV		
C25 ,26			CQ92M1H183J	MYLAR 0.018UF J		
C27 ,28			CE04CW1HR15M	ELECTRO 0.15UF 50WV		
C29 ,30			C90-0484-05	ELECTRO 0.47UF 50WV		
C31 ,32			C90-1245-05	ELECTRO 0.68UF 50WV		
C33 ,34			CQ92M1H562J	MYLAR 5600PF J		
C35 ,36			CQ92M1H472J	MYLAR 4700PF J		
C37 ,38			C90-0482-05	ELECTRO 4.7UF 25WV		
C39 ,40			CC45SL1H390J	CERAMIC 39PF J		
C41 ,42			CQ92M1H472J	MYLAR 4700PF J		
C43 ,44			CF92V1H823J	MF 0.082UF J		
C45 ,46			CE04CW1HR15M	ELECTRO 0.15UF 50WV		
C47 ,48			C90-0484-05	ELECTRO 0.47UF 50WV		
C49 -52			C90-0478-05	ELECTRO 10UF 16WV		
C53			C90-0497-05	ELECTRO 22UF 10WV		
C54 -57			CF92V1H102J	MF 1000PF J		
C58 ,59			CF92V1H183J	MF 0.018UF J		
C60 ,61			C91-0733-05	CERAMIC 33PF J		

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C62			C90-0478-05	ELECTRO 10UF 16WV		
C63			C90-0811-05	ELECTRO 330UF 16WV		
C64 ,65			C90-0824-05	ELECTRO 1UF 50WV		
C66 ,67			C91-0651-05	CERAMIC 0.001UF K		
C68			C90-0831-05	ELECTRO 33UF 10WV		
C69 ,70			C90-0482-05	ELECTRO 4.7UF 25WV		
L1 ,2			L39-0105-05	TRAP COIL		
VR1 ,2			R12-3079-05	TRIMMING POT.(10K) DOLBY LVL		
VR3 ,4	1B		R10-5014-05	POTENTIOMETER(100KB)TREB,BASS		
VR5			R12-3080-05	TRIMMING POT.(100K) DK VOL LVL		
VR6	1B		R24-3006-05	POTENTIOMETER(VOL,BAL,FADER)		
IC1			UPC1228HA	IC(OP AMP)		
IC2 ,3			HA12058MP	IC(DOLBY B/C)		
IC4			AN6556	IC(OP AMP)		
Q1 ,2			2SC2021F	TRANSISTOR		
Q3			DTC144FF	DIGITAL TRANSISTOR		
Q4 ,5			DTC114FF	DIGITAL TRANSISTOR		
SYNTHESIZER (X14-1682-70)						
C1			CE04CW1C100M	ELECTRO 10UF 16WV		
C2			CE04CW1C4R7M	ELECTRO 4.7UF 16WV		
C3			C90-0849-05	ELECTRO 220UF 16WV		
C5 ,6			CE04CW1C100M	ELECTRO 10UF 16WV		
C7			CE04CW0J470M	ELECTRO 47UF 6.3WV		
C8			C90-1263-05	ELECTRO 100UF 16WV		
C9			CE04CW0J470M	ELECTRO 47UF 6.3WV		
C10			C90-0866-05	ELECTRO 470UF 6.3WV		
C11			CE04CW1C100M	ELECTRO 10UF 16WV		
C12			C90-1263-05	ELECTRO 100UF 16WV		
C13			C91-0683-05	CERAMIC 0.022UF K		
C14 ,15			CE04CW1C100M	ELECTRO 10UF 16WV		
C16			C90-0482-05	ELECTRO 4.7UF 25WV		
C17 ,18		*	C91-0762-05	CERAMIC 0.0027UF M		
C19 ,20			CE04CW1HR47M	ELECTRO 0.47UF 50WV		
C21 ,22			CF92V1H333J	MF 0.033UF J		
C23			CE04CW1C4R7M	ELECTRO 4.7UF 16WV		
C24			C90-1273-05	TANTAL 0.1UF 16WV		
C25			CS15E1E2R2M	TANTAL 2.2UF 25WV		
C26			CF92V1H223J	MF 0.022UF J		
C27			C91-0769-05	CERAMIC 0.01UF M		
C28			CE04CW1C100M	ELECTRO 10UF 16WV		
C29			C90-1271-05	TANTAL 0.47UF 16WV		
C30			CS15E1E2R2M	TANTAL 2.2UF 25WV		
C31			CF92V1H103J	MF 0.010UF J		
C32 ,33			C91-0769-05	CERAMIC 0.01UF M		
C34 ,35			C91-0733-05	CERAMIC 33PF J		
C36 ,37			CS15E1A100M	TANTAL 10UF 10WV		
C38 ,39			CE04CW1H010M	ELECTRO 1.0UF 50WV		
C40			CS15E0J4R7M	TANTAL 4.7UF 6.3WV		
C41			C91-0677-05	CERAMIC 0.012UF K		
C42			CF92V1H823J	MF 0.082UF J		
C43			CE04CW1A330M	ELECTRO 33UF 10WV		
C44			CE04CW1C220M	ELECTRO 22UF 16WV		
C45			C90-0824-05	ELECTRO 1UF 50WV		

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C46			C90-1268-05	TANTAL 2.2UF 10WV		
C47			CE04CW1H2R2M	ELECTRO 2.2UF 50WV		
C48			C90-0811-05	ELECTRO 330UF 16WV		
C49			CE04CW1C100M	ELECTRO 10UF 16WV		
C50			C90-0866-05	ELECTRO 470UF 6.3WV		
C51			CE04CW1H0R1M	ELECTRO 0.1UF 50WV		
C52			CE04CW0J470M	ELECTRO 47UF 6.3WV		
C54			CE04CW1C470M	ELECTRO 47UF 16WV		
C55			C90-1263-05	ELECTRO 100UF 16WV		
C56			CE04CW1C100M	ELECTRO 10UF 16WV		
C57			CE04CW1C4R7M	ELECTRO 4.7UF 16WV		
C58			CC45SL1H101J	CERAMIC 100PF J		
C59			CS15E1V0R1M	TANTAL 0.1UF 35WV		
C60			CF92V1H823J	MF 0.082UF J		
C61			C90-1263-05	ELECTRO 100UF 16WV		
C62			CE04CW0J220M	ELECTRO 22UF 6.3WV		
C63			CE04CW1C100M	ELECTRO 10UF 16WV		
C64			CE04CW1H010M	ELECTRO 1.0UF 50WV		
C65 ,66			CE04CW1C100M	ELECTRO 10UF 16WV		
C67 -70			C90-1270-05	TANTAL 1UF 16WV		
C71 ,72			C91-0683-05	CERAMIC 0.022UF K		
C73			CE04CW1H2R2M	ELECTRO 2.2UF 50WV		
C74			CE04CW1C100M	ELECTRO 10UF 16WV		
C75			C90-0506-05	ELECTRO 0.22UF 50WV		
C76			C90-1271-05	TANTAL 0.47UF 16WV		
C77 ,78			CE04CW1C100M	ELECTRO 10UF 16WV		
C79			CE04CW1C470M	ELECTRO 47UF 16WV		
C80 ,81			CE04CW1C220M	ELECTRO 22UF 16WV		
C82			C90-0866-05	ELECTRO 470UF 6.3WV		
C83			CE04CW1C100M	ELECTRO 10UF 16WV		
C101-103			C91-0675-05	CERAMIC 0.01UF K		
C104-106			C91-0683-05	CERAMIC 0.022UF K		
C107			C90-0478-05	ELECTRO 10UF 16WV		
C108,109			C91-0683-05	CERAMIC 0.022UF K		
C110			C90-0824-05	ELECTRO 1UF 50WV		
C111			C91-0683-05	CERAMIC 0.022UF K		
C112			CK45B1H151K	CERAMIC 150PF K		
C113			C90-0506-05	ELECTRO 0.22UF 50WV		
C114			C91-0683-05	CERAMIC 0.022UF K		
C115			CC45SL1H330J	CERAMIC 33PF J		
C116			C90-0482-05	ELECTRO 4.7UF 25WV		
C117			C90-0824-05	ELECTRO 1UF 50WV		
C118			C91-0683-05	CERAMIC 0.022UF K		
C119			CK45B1H222K	CERAMIC 0.0022UF K		
C120			C90-0849-05	ELECTRO 220UF 16WV		
C121			C91-0745-05	CERAMIC 100PF K		
C122			CE04BW1E4R7M	NP-ELEC 4.7UF 25WV		
C123			C90-0497-05	ELECTRO 22UF 10WV		
C124			C90-1259-05	ELECTRO 470UF 10WV		
C125			C90-0482-05	ELECTRO 4.7UF 25WV		
C126			C91-0691-05	CERAMIC 0.047UF K		
C127			C91-0679-05	CERAMIC 0.015UF K		
C128			CE04W1C220M	ELECTRO 22UF 16WV		
C129			C91-0763-05	CERAMIC 0.0033UF M		
C130			C91-0687-05	CERAMIC 0.033UF K		

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C131			C90-0477-05	ELECTRO 0.1UF 50WV		
C132,133			C90-0824-05	ELECTRO 1UF 50WV		
C134			C90-0502-05	ELECTRO 3.3UF 35WV		
C137			CQ92P2A102J	MYLAR 1000PF J		
C138,139			C91-0753-05	CERAMIC 470PF K		
C140,141			CF92V1H473J	MF 0.047UF J		
C142,143			C90-0478-05	ELECTRO 10UF 16WV		
C144,145			C90-0494-05	ELECTRO 22UF 6.3WV		
C146,147			C91-0749-05	CERAMIC 220PF K		
C148			CE04W1A470M	ELECTRO 47UF 10WV		
C149			C90-0480-05	ELECTRO 47UF 10WV		
C150-153			C90-0478-05	ELECTRO 10UF 16WV		
C154			C90-0811-05	ELECTRO 330UF 16WV		
C155			C91-0683-05	CERAMIC 0.022UF K		
C156			CE04W1A470M	ELECTRO 47UF 10WV		
C157			C90-0482-05	ELECTRO 4.7UF 25WV		
C158			C90-0849-05	ELECTRO 220UF 16WV		
C159			C90-0478-05	ELECTRO 10UF 16WV		
C160			C90-0820-05	ELECTRO 470UF 16WV		
C161			C90-1256-05	ELECTRO 1000UF 16WV		
C162			C90-0482-05	ELECTRO 4.7UF 25WV		
C163			CC45SL1H180J	CERAMIC 18PF J		
C164			CK45B1H681K	CERAMIC 680PF K		
303	1A	*	E30-0911-05	DC CORD		
MK1		*	E10-1302-05	FLAT CABLE CONNECTOR		
MK2		*	E10-1503-05	FLAT CABLE CONNECTOR		
MK19	1A		E30-0869-15	CORD WITH DIN CONNECTOR(FRONT)		
MK20	1A		E30-0871-15	CORD WITH DIN CONNECTOR(REAR)		
CF1 ,2			L72-0135-05	CERAMIC FILTER		
L1			L40-4791-02	SMALL FIXED INDUCTOR(4.7UF,K)		
L2			L40-2205-25	SMALL FIXED INDUCTOR(22UH,J)		
L3			L30-0388-05	FM IFT		
L4		*	L39-0120-05	PEAKING COIL (3.55MH)		
L5 ,6			L79-0145-05	LC FILTER		
X1			L77-0585-05	CRYSTAL RESONATOR (4.5MHZ)		
CP1 ,2		*	R90-0417-05	MULTI-COMP 47KX4		
CP3		*	R90-0418-05	MULTI-COMP 47KX5		
CP4		*	R90-0419-05	MULTI-COMP 47KX3		
CP5		*	R90-0413-05	MULTI-COMP 1KX5		
CP6			R90-0430-05	MULTI-COMP 1.6K,510		
R7			RD14DB2H2R2J	SMALL-RD 2.2 J 1/2W		
R13			RD14DB2H100J	SMALL-RD 10 J 1/2W		
R17			RD14DB2H471J	SMALL-RD 470 J 1/2W		
R29		*	RD14DB2H102J	SMALL-RD 1.0K J 1/2W		
R65		*	RS14AB3D330J	FL-PROOF RS 33 J 2W		
R214			RD14DB2H331J	SMALL-RD 330 J 1/2W		
VR1			R12-3301-05	TRIMMING POT.(20K)AM STOP		
VR2			R12-3078-05	TRIMMING POT.(22K)FM STOP		
VR3			R12-3079-05	TRIMMING POT.(10K)SEPARATION		
VR4			R12-3080-05	TRIMMING POT.(47K)PILOT CANCEL		
VR5			R12-3079-05	TRIMMING POT.(10K)VCO		
S1 -7	3A		S40-2145-05	PUSH SWITCH		

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D1 -3			DAN201	DIODE		
D5 -24			DAN201	DIODE		
D31 ,32			EK03	DIODE		
D33			DSM1A1	DIODE		
D34			1N60	DIODE		
D41			GMA01	DIODE		
D44 -65			GMA01	DIODE		
D44 -65			1SS176	DIODE		
D66			1S1555	DIODE		
D67 -74			GMA01	DIODE		
D67 -74			1SS176	DIODE		
D76 ,77			GMA01	DIODE		
D76 ,77			1SS176	DIODE		
D81 ,82		*	MTZ10J	ZENER DIODE		
D81 ,82			RD10JS(B)	ZENER DIODE		
D83		*	RD6.2JS(B)	ZENER DIODE		
D84 -86		*	MTZ6.2J	ZENER DIODE		
D84 -86			RD6.2JS(B)	ZENER DIODE		
D87		*	MTZ5.6J	ZENER DIODE		
D87			RD5.6JS(B)	ZENER DIODE		
D88		*	RD5.6JS(B)	ZENER DIODE		
D89		*	MTZ5.6J	ZENER DIODE		
D89			RD5.6JS(B)	ZENER DIODE		
D90		*	RD5.1JS(B)	ZENER DIODE		
D91		*	RD6.2JS(B)	ZENER DIODE		
D101-104			GMA01	DIODE		
D101-104			1SS176	DIODE		
D106			GMA01	DIODE		
D106			1SS176	DIODE		
D110		*	RD6.2JS(B)	ZENER DIODE		
D112			GMA01	DIODE		
D112			1SS176	DIODE		
D113,114			EK03	DIODE		
IC1		*	UPD1710G-012	IC(DIGITAL TUNING SYSTEM)		
IC2			UPB553AC	IC(PRE SCALER)		
IC3			M54563P	IC(8 CH TRANSISTOR ARRAY)		
IC4			UPA81C	IC(7 CH TRANSISTOR ARRAY)		
IC5			TC9135P	IC(6 CH TOUCH SWITCH)		
IC6			TK10320	IC(SELECTOR)		
IC7			TA7341P	IC(BLANK DET FOR TAPE ADVANCE)		
IC8			AN6556	IC(OP AMP)		
IC9		*	AF027	IC(BK FILTER)		
IC10,11			UPD4081BC	IC(AND GATE)		
IC12			TC4081BF	IC(AND GATE)		
IC12			UPD4081BG	IC(AND GATE)		
IC13			UPD4069UBG	IC(INVERTOR)		
IC21			LA1140	IC(FM IF/DET)		
IC22		*	TD3S600	IC(SK DET)		
IC23			KC-820	IC(NOISE CANCELLER)		
IC24			LA3376	IC(FM MPX)		
IC25			NJM2041S-D	IC(OP AMP)		
Q1			2SC2021F	TRANSISTOR		
Q2			DTA144FF	DIGITAL TRANSISTOR		
Q3 -5			DTC144FF	DIGITAL TRANSISTOR		
Q7			DTC144FF	DIGITAL TRANSISTOR		

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Q8			2SC2021F	TRANSISTOR		
Q9			DTC144FF	DIGITAL TRANSISTOR		
Q10 ,11			2SC2021F	TRANSISTOR		
Q13			2SC2021F	TRANSISTOR		
Q14			DTC124FF	DIGITAL TRANSISTOR		
Q21 ,22			2SC2021F	TRANSISTOR		
Q23			DTC144FF	DIGITAL TRANSISTOR		
Q24 ,25			2SC2021F	TRANSISTOR		
Q26 ,27			DTC144FF	DIGITAL TRANSISTOR		
Q31			DTA144FF	DIGITAL TRANSISTOR		
Q32			DTC124FF	DIGITAL TRANSISTOR		
Q33 -36			DTC144FF	DIGITAL TRANSISTOR		
Q37			2SC2021F	TRANSISTOR		
Q41 -51			DTC144FF	DIGITAL TRANSISTOR		
Q52			DTA144FF	DIGITAL TRANSISTOR		
Q53 -57			DTC144FF	DIGITAL TRANSISTOR		
Q58			DTA144FF	DIGITAL TRANSISTOR		
Q59 ,60			2SC2021F	TRANSISTOR		
Q61 -64			DTC144FF	DIGITAL TRANSISTOR		
Q71 ,72			2SD638	TRANSISTOR		
Q73			2SB643	TRANSISTOR		
Q74			DTC144FF	DIGITAL TRANSISTOR		
Q75			2SB793A	TRANSISTOR		
Q76			2SC2021F	TRANSISTOR		
Q77			2SB643	TRANSISTOR		
Q78			DTC144FF	DIGITAL TRANSISTOR		
Q79			2SB793A	TRANSISTOR		
Q80			DTC144FF	DIGITAL TRANSISTOR		
Q81			2SD638	TRANSISTOR		
Q82			2SD973	TRANSISTOR		
Q91			DTA144FF	DIGITAL TRANSISTOR		
Q92			DTC144FF	DIGITAL TRANSISTOR		
Q93		*	DTA143FF	DIGITAL TRANSISTOR		
Q94 -96			DTC144FF	DIGITAL TRANSISTOR		
Q101			2SC2786(L,K)	TRANSISTOR		
Q102			DTA144FF	DIGITAL TRANSISTOR		
Q103			DTC144FF	DIGITAL TRANSISTOR		
Q105			2SC2021F	TRANSISTOR		
Q106,107			2SD1020(H,F,E)	TRANSISTOR		
Q108,109			2SK330	FET		
Q110			DTA144FF	DIGITAL TRANSISTOR		
Q111			2SD638	TRANSISTOR		
Q112			DTC114FF	DIGITAL TRANSISTOR		
Q113			2SB873(Q,R)	TRANSISTOR		
Q114			2SC2021F	TRANSISTOR		
Q115			2SB793A	TRANSISTOR		
TH1			ERT-D2FFL102S	THERMISTOR		
301		*	W02-0593-05	TUNER ASSY		
302		*	W02-0594-05	FM FRONT-END ASSY		
ELECTRICAL PARTS (MECHANISM)						
C01 ,02			CE04W1C100M	ELECTRO 10UF 16WV		
C03			CE04W1H010M	ELECTRO 1UF 50WV		
C04 ,05			CQ92M1H332J	MYLAR 0.0033UF J		
C06			CE04W1HR22M	ELECTRO 0.22UF 50WV		

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C07			C90-0486-05	ELECTRO 220UF 16WV		
R01			RD14BB2H101J	RD 100 J 1/2W		
R13			RD14BB2H4R7J	RD 4.7 J 1/2W		
S03			S31-6012-08	SLIDE SWITCH (DIRECTION)		
S04 ,05			S59-1065-08	REED SWITCH (ROTATION DET)		
HD01			T31-0010-08	PLAYBACK HEAD		
D01			HZ9C-2	ZENER DIODE		
D01			WZ-092	ZENER DIODE		
D02			HZ12C-1	ZENER DIODE		
D02			WZ-135	ZENER DIODE		
D03			1S1555	DIODE		
D03			1S2076	DIODE		
D04 ,05			GMA01	DIODE		
D04 ,05			MA165TA	DIODE		
D06			DS135D	DIODE		
D06			W06B	DIODE		
IC01			A55987F01	IC		
IC02			M54838L	IC		
IC03			STA401A	IC		
Q01			2SA1020(Y)	TRANSISTOR		
Q01			2SB793A(R)	TRANSISTOR		
TUNER ASS'Y (W02-0593-05)						
D1 -4		*	1SS110	DIODE		
D1 -4			1SS53	DIODE		
D1 -4			1S1555	DIODE		
D5 -7			SVC321	DIODE		
D5 -7		*	1SV149	DIODE		
FET1			2SK163	FET		
FET2		*	2SK184	FET		
TR1 -5		*	2SC2620	TRANSISTOR		
TR1 -5		*	2SC2714	TRANSISTOR		
TR1 -5		*	2SC2814	TRANSISTOR		
TR6		*	2SC2669	TRANSISTOR		
FM FRONTEND ASS'Y (W02-0594-05)						
FET1		*	2SK359	FET		
TR1 -3		*	2SC2714	TRANSISTOR		
SCREW SET (N99-0071-05)						
-			NO STOCK	HEXAGON WRENCH KEY		
-			N09-0335-05	PAN HEAD TAPPING SCREW(ø5X16)		
-			N09-0336-05	HEXAGON HEAD BOLT (M5X20)		
-			N10-1050-46	NUT (M5)		
-			N15-1050-46	FLAT WASHER (M5X12)		
CASSETTE MECHANISM ASS'Y (D40—0280-05)						
1	1C		T42-0024-08	MOTOR ASSY		
2	1C		T94-0035-08	SOLENOID (SENSOR)		
3	1C		D14-0075-08	PINCH ROLLER ASSY		
4	1C		W02-0555-08	PCB ASSY		
6	1C		D10-0297-08	LEVER (SOLENOID)		
7	1C		J21-1887-28	CASSETTE HOLDER ASSY		
8	1C		J21-3031-08	HOLDER ARM ASSY		
9	1C		G01-0374-18	COIL SPRING (TURN)		

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11	1C		G02-0087-08	SPRING (HEAD ADJUSTMENT)		
12	1C		N24-3030-60	WASHER C		
14	1C		G01-0379-08	COIL SPRING (PINCH ROLLER)		
20	2C		T94-0036-08	SOLENOID (FWD/REV)		
21	2C		T94-0037-08	SOLENOID (FWD/REV)		
22	2C		G01-0385-08	TENSION COILED SPRING		
23	2C		G01-0403-08	COIL SPRING		
24	2C		G01-1308-08	TENSION COILED SPRING		
25	2C		G01-0383-08	COIL SPRING (R/F IDLER)		
26	2C		G01-1311-08	TENSION COILED SPRING		
27	2C		D13-0101-08	GEAR ASSY		
28	2C		D10-0360-08	LEVER		
29	2C		D13-0100-08	GEAR (R/F IDLER)		
34	2C		N19-0355-08	WASHER		
40	3C		D13-0099-08	GEAR		
41	3C		N19-0354-08	WASHER		
42	3C		N24-3030-60	WASHER		
43	3C		D10-0362-08	LEVER		
45	3C		D03-0223-08	REEL BRACKET ASSY		
51	3C,3D		N29-0056-08	WASHER (LOCK)		
52	3C,3D		N29-0057-08	WASHER (LOCK)		
53	3C,3D		N19-0354-08	WASHER		
54	3C		D13-0071-08	GEAR (TAKE UP)		
61	1D		D14-0076-08	PINCH ROLLER ASSY		
62	1D		J31-0156-18	SPACER		
63	1D		J31-0157-18	SPACER		
64	1D		N24-3012-60	WASHER C		
66	1D		J31-0156-18	SPACER		
67	1D		G01-0378-08	COIL SPRING (PINCH ROLLER)		
68	1D		G01-0377-08	TENSION COILED SPRING		
69	1D		D14-0062-08	ROLLER (HEAD BASE)		
70	1D		G01-1314-08	TENSION COILED SPRING		
72	1D		G01-0435-08	TENSION COILED SPRING		
73	1D		D10-0278-18	LEVER (EJECT LOCK)		
74	1D		J31-0164-08	SPACER		
75	1D		D10-0279-18	LEVER (SUB)		
76	1D		D10-0296-08	PLATE (HEAD LOCK)		
77	1D		G01-0373-08	TENSION COILED SPRING		
78	1D		J19-0595-08	PLATE (PINION)		
79	1D		J11-0051-08	LUG		
80	1D		G01-0382-08	SPRING (SOLENOID)		
81	1D		G01-0404-08	TENSION COILED SPRING		
82	1D		J31-0163-08	SPACER		
83	1D		D13-0062-08	GEAR (PULLEY)		
90	2D		D13-0070-08	GEAR EJECT ASSY		
91	2D		T94-0015-08	SOLENOID		
93	2D		S56-1022-08	SWITCH (SENSITIVE SWITCH)		
94	2D		S46-1010-08	SWITCH (LEAF)		
97	2D		T94-0018-08	SOLENOID		
98	2D		G01-0425-08	TENSION COILED SPRING		
110	3D		D13-0060-08	GEAR (PULLEY WHEEL)		
111	3D		W02-0518-08	HEAD AND SWITCH ASSY		
112	3D		D16-0059-08	BELT		
113	3D		D01-0036-08	FLYWHEEL ASSY		
114	3D		D13-0061-08	GEAR (REVERSE IDLER)		

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115	3D		N19-0302-08	WASHER		
120	1C		D14-0062-08	COLLAR (HEAD BASE)		
121	1C		D19-0071-08	CASSETTE GUIDE		
122	1C		N24-3015-60	E TYPE RETAINING RING		
123	1C		A11-0145-08	HEAD BASE ASSY		
124	1D,2C		N24-3025-60	E TYPE RETAINING RING		
125	2C		J30-0203-08	SPACER (WASHER)		
128	2C		D10-0356-08	LINK ASSY (F/R)		
129	3C		D10-1370-08	LEVER ASSY (F/R ACTIVATE)		
130	3C		J25-4529-08	PC BOARD (REED SWITCH)		
131	3D		D13-0102-08	REEL ASSY (WITH MAGNET)		
132	3D		J39-0074-08	SPACER		
133	3C		J39-0073-08	SPACER		
136	1D		N19-0539-08	WASHER		
137	3C		J21-3243-18	PLATE ASSY (FLYWHEEL RETAINER)		
138	3C		G01-1599-08	SPRING		
139	2C		G01-1390-08	SPRING		
140	3C		G01-1313-08	SPRING		
143	1D		G01-1314-08	SPRING		
144	1D		N19-0300-08	FLAT WASHER		
145	1D		J21-3587-08	FRAME LEVER ASSY		
146	2D		D13-0255-08	GEAR (GUIDE)		
147	1D		D10-1371-08	LEVER ASSY (EJECT)		
150	2D		J19-0097-08	PIN (SOLENOID)		
151	2D		D13-0256-08	GEAR (EJECT IDLER)		
152	2D		D10-1369-08	HEAD BASE ASSY		
153	2D		D10-0298-08	LEVER (REVERSE)		
155	2D		D10-1368-08	LEVER ASSY (REVERSE)		
158	2C		G01-1598-08	SPRING		
159	2C		J21-3337-08	BRACKET ASSY(GUIDE)		
160	1D		D13-0257-08	CASE (GEAR)		
161	1D,2D		D13-0254-08	GEAR ASSY (PLANET)		
162	3D		D13-0253-08	GEAR (CHANGE)		
165			J25-1895-18	PC BOARD		

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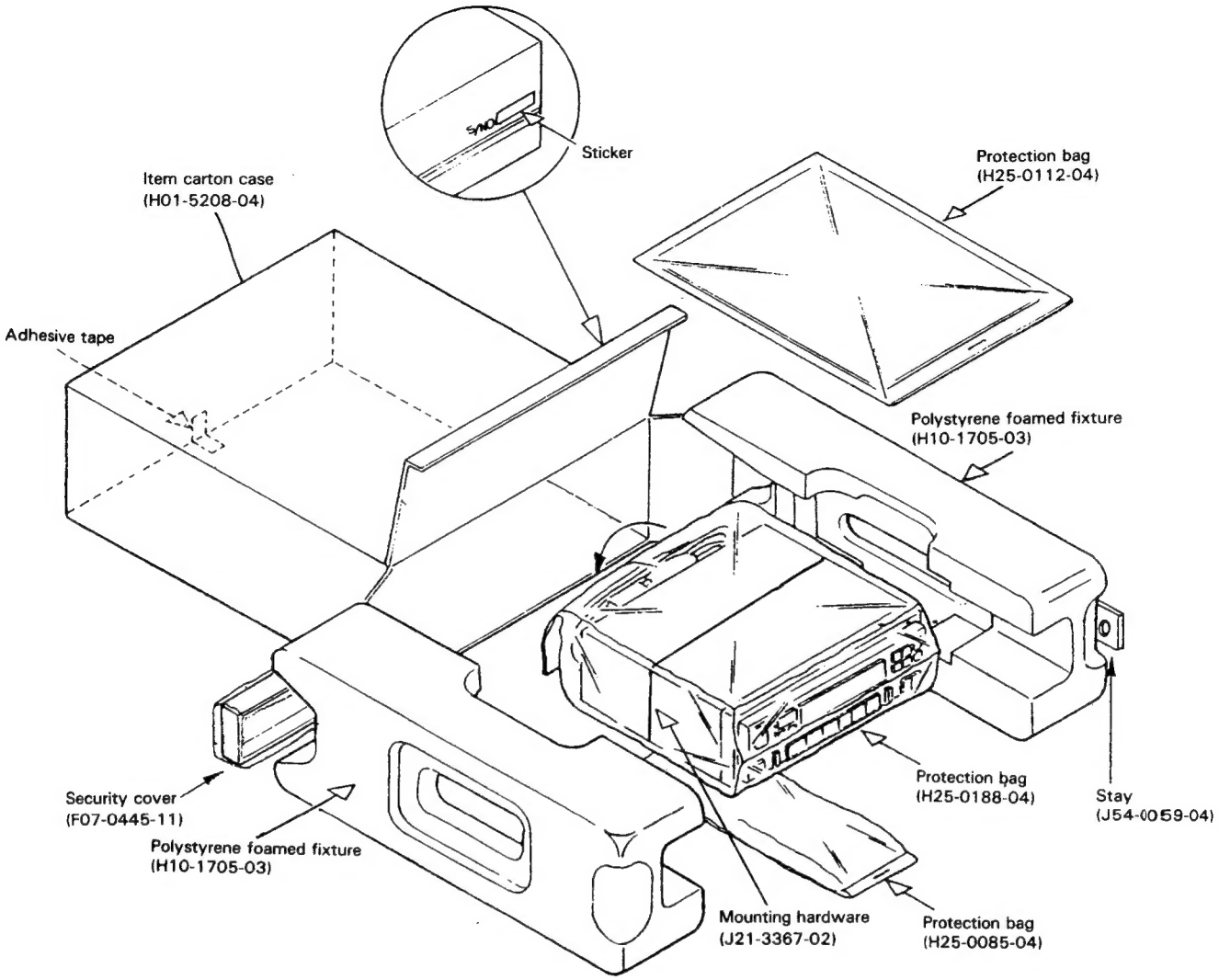
PACKING


Sticker
Item carton case
(H01-5208-04)
Protection bag
(H25-0112-04)
Adhesive tape
Polystyrene foamed fixture
(H10-1705-03)
Protection bag
(H25-0188-04)
Stay
(J54-0059-04)
Security cover
(F07-0445-11)
Polystyrene foamed fixture
(H10-1705-03)
Mounting hardware
(J21-3367-02)
Protection bag
(H25-0085-04)